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ABSTRACT

The New York State Outdoor Education Association is dedicated to: (1) the professional improvement of persons interested and involved in outdoor education, and (2) the development of attitudes, values, and behavior necessary for the wise use of natural resources. Its major goal is the enrichment of educational curriculums through the use of the outdoors as a living and learning laboratory. "The Communicator", the Association's official journal, consists of articles contributed by outstanding authorities in outdoor education. Due to numerous requests for back issues of "The Communicator", this booklet provides 30 articles which appeared in various issues between 1970 and 1975. Addressing the Association's goals, the articles deal with outdoor education philosophy and methodology, ecological classrooms, resident camping experiences, teaching tips, and classroom projects. Among the topics are: outdoor education in the educative process, basic considerations for outdoor education, environmental programs, nature trails, professional preparation in outdoor education, teaching social studies and art outdoors, orienteering, survival, the outdoors as a learning center, ecology, and the environmental crisis. (NQ)

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The Best of *THE COMMUNICATOR* 1970-1975

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JOURNAL OF THE NEW YORK STATE OUTDOOR EDUCATION ASSOCIATION

Special Issue - The Best of THE COMMUNICATOR, 1970-75

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Preface

"THE BEST OF THE COMMUNICATOR"

BECAUSE OF NUMEROUS REQUESTS FOR BACK ISSUES OF THE JOURNAL, which we are unable to supply due to a limited printing, we have been prompted to gather together what we consider to be "THE BEST OF The Communicator".

This is a booklet of *selected articles* duplicated from The Communicator, (1970-75), the journal of the New York State Outdoor Education Association.

The major goal of the New York State Outdoor Education Association is the enrichment of educational curriculums through the use of the outdoors as a living and learning laboratory. We are dedicated to the professional improvement of persons interested and involved in outdoor education, and the development of attitudes, values, and behavior necessary for the wise use of natural resources.

The following articles address the above goals by dealing with outdoor education philosophy and methodology, ecological classrooms, resident camping experiences, teaching tips, and classroom projects. The authors, many nationally known, are all outstanding outdoor educators willing to share their knowledge and experiences to aid others in this exciting field of education.

HAPPY READING!

Norman Skliar

Editorial Director,
The Communicator

Administrator, Outdoor and
Environmental Education
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OUTDOOR EDUCATION — THERE'S SOMETHING IN IT FOR EVERY ONE

BY: *Dr. Irwin Rosenstein*

Many people today, before making a decision to become involved in something, ask the question "What's in it for me?" When outdoor education is properly interpreted and one asks the same question in regard to becoming involved in this process of learning, it is always gratifying to be able to respond "There's something in it for everyone."

Outdoor education is education in, for and about the outdoors. It is the utilization of outdoor resources to reinforce and enrich classroom learning and make it more meaningful and enjoyable. It involves first hand learning experiences which emphasize the inter-relationships between human beings and the real world in which they live. It is not a separate discipline with its own body of knowledge and definitive objectives. Outdoor education involves all subjects within the educational curriculum and contributes to an interdisciplinary approach to education.

Throughout the years a variety of terms have been associated with the concept of outdoor education; some of these include nature study, conservation education, school camping, and more recently environmental education. All of them contribute to and play an important role in outdoor education, but outdoor education is a comprehensive educational process and therefore includes all of these terms and the learning experiences they represent.

Relative to the broad meaning of outdoor education, some educational centers use the term nature center or environmental education center. For those centers that place primary emphasis on nature study, ecology and environmental studies this properly describes the types of programs offered. However, other centers provide not only these experiences, but they also do an excellent job of using the outdoors to teach a variety of learning experiences in curriculum areas such as social studies, mathematics, language arts, health education, physical education, home economics, industrial arts, music, art, and occupational education. These are outdoor education centers in the truest sense – teaching in, for and about the outdoors and relating it to the many subjects which comprise the educational curriculum.

The growth of outdoor education in New York State has increased greatly over the past few years. More and more schools, colleges and universities are becoming actively involved in providing outdoor education experiences for their students and teachers, as well as members of the community. The Department of Environmental Conservation has played a leadership role in working with individuals and organizations to expand that aspect of outdoor education concerned with environmental studies programs. The State Education Department, through a total curriculum approach, has made a significant contribution by working with elementary and secondary schools, as well as colleges and universities, in the organization and implementation of outdoor education programs for both teachers and students.

The expansion of outdoor education programs directly relates to an understanding of its total concept. When outdoor education is interpreted as being curriculum centered, then the use of the outdoors as a classroom includes a variety of interrelated subject matter experiences and more teachers and students become involved in the process.

As a professional association dedicated to this total concept, the New York State Outdoor Education Association (NYSOEA) makes important contributions to the establishment and expansion of outdoor education programs through the following services:

WORKSHOPS AND CONFERENCES

NYSOEA holds numerous inservice education workshops for teachers in different areas of the state. These workshops provide teachers with an understanding and the techniques of using the outdoors as a classroom for learning and living. NYSOEA also conducts an annual conference that offers numerous opportunities for individuals to expand their knowledge of and competence in outdoor education.

PUBLICATIONS – NEWSLETTER AND JOURNAL

NYSOEA publishes an informative monthly newsletter, Think About It. This newsletter serves as a media for the exchange of ideas and information on many different aspects of outdoor education. The official journal of NYSOEA is The Communicator. The quality of this publication if reflected through its excellent articles, which are contributed by outstanding authorities in outdoor education. The circulation of the journal includes subscribers from many states throughout the country, as well as Canada.

CONSULTANTS

NYSOEA offers consultant services in outdoor education to educational institutions, organizations and agencies interested in using the outdoors as a learning laroratory. NYSOEA, through its regional organization, provides resource people within each region of the state and they serve as consultants to individuals and organizations requesting assistance.

These services are carried on through the cooperative efforts of NYSOEA members. These members are individuals with different backgrounds, interests and education. This diversification is good because it substantiates the interdisciplinary approach to outdoor education.

I am pleased that NYSOEA is dedicated to the total concept of outdoor education. I am proud to have the opportunity to serve as President of the Association and represent its membership in carrying forth this concept.

"What's in it for me?" When one asks this question about outdoor education or the New York State Outdoor Education Association, the response is still the same: "There's something in it for everyone!"

To Swing A Wild Grape Vine

BY: *Margery Facklam*
Buffalo, N.Y.

Don't pack nature into th shape of the curriculum"

Whenever I see a bus empty its load of children at a nature sanctuary, I think how sad it is that we have put nature in the same category as showing extinct dinosaur bones or ancient mummies in a museum. Nature is no longer an integral part of man's life. It has become a museum piece.

The Buffalo Museum of Science education department offers several programs to schools. We conduct guided tours of the museum, teacher workshops, Saturday classes and clubs for children, and we take the Haul of Science, our pythonwrapped (in paint only) van, to schools for Museum Days. But our best and most popular programs happen when we take to the woods.

We guide groups through Shale Creek Nature Sanctuary, a 90 acre tract of wooded land set aside by Erie County as a living laboratory of ecology. Because of travel time involved, most groups have only an hour or two to spend on the trails.

We know that an hour of nature is not outdoor education. But you have to begin somewhere. That hour in the woods, smelling the hemlock, feeling the moss, tasting the crisp wild grape tendril, touching a wet frog, may be the drug that hooks just one child. And that would be worth all the problems involved in getting kids to our disappearing open areas.

Most problems with outdoor education programs would decrease with some practical preparation. Children, and teachers too, arrive wearing sandals or high heeled shoes. When you are worrying about where you'll step next, you don't see much more than your feet. When you are carrying paper bags, pop cans, or transistor radios, you are not exactly tuned to nature. So we ask teachers to talk to students about the field trip . . . where they are going, how to dress, how to walk on trails, and what the can expect to see.

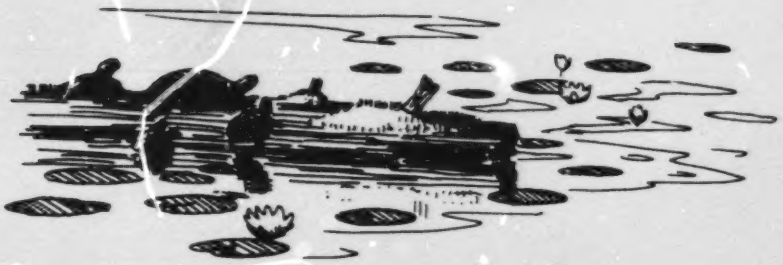
City kids, comfortable with concrete underfoot and buildings overhead, may worry about going into the unknown of the woods. What evil lurks behind those trees, around the bend of the creek? What wildlife will leap out at you from behind a boulder? Not everyone is an outdoor person, and we must be aware of real fears children may be expressing when they say, "Man, I'm not going in <u>those</u> woods." Just as we cannot turn every child on to math or literature, so we cannot make every child a naturalist. But we can make them aware of the natural world, of things not plastic and asphalt.

It is these city children who most desperately need this contact with the rural outdoors. We need to give them a chance to care. People who feel nothing for the natural world, who do not understand the delicate balances of life, will do nothing to preserve them until it is too late to do anything but say, "Why didn't somebody tell us?"

Our main objective as outdoor educators should be the teaching of attitudes. It is not nearly so important to know the correct name of every worm or insect as it is to feel comfortable with them, to feel like NOT destroying them, to know that they, too, have a job to do. The most important science lesson we can teach, from preschool to graduate school, is man's relationship to his world. No other concept is more important than the fact that man is but one boarder on this closed space ship. He does not own it, but he does, by virtue of his reason, need to be its resident landlord.

We begin our interpretive nature walks, hopefully with twenty or fewer in a group, by moving quickly down the trail. If you stop to lecture about what you're going to see, you'll have bored, inattentive kids before you start. Our first stop is usually planned, and it is almost always the same thing each trip, but we make it sound as though it's a new find. "Wow, look at this". It's more fun to be a discoverer than a mere viewer. So we gather around the rotting log we know will be full of beetles or slugs, or the racoon's footprints, or the owl pellets we have been sneaky enough to plant earlier. And we do a kind of show and tell.

The person who wrote "I hear and I forget; I see and I remember: I do and I understand" was a master teacher. We try for the doing and seeing as much as possible. You can tell a group in a classroom about brush



piles and their usefulness. Chances are they won't remember. But if you have the children collect wood and forest litter for a brush pile, they will remember it, be concerned about it and understand it.

If you tell the kids they are going to learn a list of five trees, you have lost all but the most noble of the class. But if they taste the cherry bark, find mitten-shape sassafras leaves, or hear you tell how birch beer is made from the birch trees, they will learn five trees without even realizing they've done it.

If your outdoor education program takes place in an area not populated by exciting wildlife like gorillas and bears, you have to transfer your own excitement for the wildlife that is there. You have to make the crayfish, newts, and toads as interesting to them as you know they are. Wildlife is everywhere, but mostly underfoot. We stress the ecology of the soil, the natural litter compared to the man made litter. We show them how a rotting log is returning to the soil, recycling itself. And then we find an aluminum pop can and ask the children to guess how many centuries it would take to decay.

Even more interesting than the interpretive nature walks is the time we put in as resource teams for schools' campout programs. This is really fun because we don't have the tedious job of planning how much hot chocolate is needed, how many hot dog rolls, sending out permission slips, but most of all we never have the pressure of having to justify an outdoor education program as a viable part of the curriculum. We are convinced it is a basic part of education, but we don't have to sell a school board the idea. We believe that if the children did nothing but lie on a hill and watch clouds (without knowing a cirrus from a cumulus), or watch a crayfish scuttle backwards through a creek (without knowing its scientific classification), the program would be a success.

In an effort to make the program seem "scientific" enough, to justify it as a learning experience, the children sometimes get buried in activities. They literally do not see the forest for the trees; they do not see the polliwogs for the blanks they have to fill in on the sheet marked Pond Ecology. They may miss the sight of swallows swooping low over the pond for insects because they are filling out ditto sheets.

One hot June afternoon I led a group of fifth graders on a "creek ecology" walk, their sixth in a series of different walks since breakfast. They had orders to stay dry, to listen attentively, and to find certain things on a list.

Well, how can you walk in or near a creek and stay dry, at least on a hot day? Any information I offered about shale creek beds, or newts, or water striders met with "Aw, we saw that this morning" or with silence (a more polite but more powerful comment.)

Finally, feeling guilty but too hot to care, I sat on a stone in the creek and took off my wet sneakers. With great joy, the kids did, too. One boy reached out and picked up a handful of mud, probably to sling at someone. But when he started to squeeze it into a ball he said, "Hey, this is clay."

So all the kids began to dig clay and we talked about where clay comes from and who lives in clay stream banks. As we talked we pinched pots as the Indians of our area had done centuries before. When we heard the camp bell signalling the end of that session, all of us were truly sorry.

The moral? Don't pack nature into the shape of the curriculum. Let the lesson fit the shape of nature. While there are certain concepts you can plan on teaching ahead of time, let your plans be like quick silver, free to flow in different shapes.

Teaching in a museum is the dessert on the education menu. We don't have the day to day responsibility for getting kids through long division or spelling. We don't have to worry about grades or testing. We get paid to swing on a wild grape vine and collect frogs. Through the years of calling what we do nature study, then conservation, and now outdoor education, we have continued to preach the gospel of the great web of life. We hope someone is listening.

PHOTOS BY: Norman Skliar

OUTDOOR EDUCATION IN THE EDUCATIVE PROCESS

By: DONALD R. HAMMERMAN
Director, Lorado Taft Field Campus

Outdoor Education is often referred to as a commonsense approach to education. Let us examine a few of the commonsense elements of outdoor education.

1. Does it make sense for a teacher to leave the classroom where he has the latest texts and teaching equipment to take his pupils on a nature ramble?

2. Does it make sense to take students out of school for a whole week to a camp setting where they spend a lot of time just living together?

3. Does it make sense to transport youngsters from the innercity to a completely foreign environment, knowing they will have to return to the intolerable living conditions and the jaded existence of ghetto living afterwards?

The reply to each of these questions is, yes, it makes sense to do these things. These are commonsense approaches to education.

First, because instructional environments beyond the school provide a setting where learning takes on an immediacy and makes an impact not found in the textbook.

Secondly, because there are things to be learned about one another, and about living together that we had better learn before it is too late.

Thirdly, because inner-city children need to become aware that the world is larger than their world of crowded tenements, dark alleys and gang rivalries. With the knowledge that my present world extends beyond me and what I am today there may be the aspiration plus the motivation to either break out from my world, or to try and change it for the better.

This article will briefly touch upon some of the commonsense qualities, characteristics, or principles of outdoor education in the educative process.

The first commonsense principle is that it makes a great deal of sense to carry on the business of learning in an instructional setting where that which is being studied may make the greatest impact on the learner. An almost inexhaustible number of instructional environments exist beyond the school which afford both teacher and learner an opportunity to be involved in and with a variety of firsthand experience.

Direct experience exposes the learner to an assortment of sensory and perceptual data from which he may formulate new concepts and grasp other meanings so that prior knowledge is continually being refined and reconstructed.

The second commonsense element or component of outdoor education is inquiry as it relates to problem solving. Inquiry is the act of searching out data, usually through a process of first questioning – then investigating. Discovery occurs when the investigator-learner gains insight or knowledge of something previously unseen or unknown. The two processes inquiry and discovery work hand in hand in moving toward problem solving.

Inquiry leads to discovery .....
Discovery promotes insight .....
Insight provides understanding .....
Understanding contributes to knowledge .....
Answers ..... And answers, in turn
lead to more questions ..... inquiry.

So we swing full cycle. There is at the same time closure, or an end in terms of having found some answers, and a beginning in terms of recognizing new problems.

Outside-the-school-environments seem to lend themselves particularly to problem solving. In school today little allowance is made for mistakes. Students with right answers are rewarded. Students with wrong answers are penalized. I am not recommending that we place a premium on wrong answers, but I do suggest that it is probably just as important in the problem solving process to allow problem solvers to arrive at unsatisfactory answers or solutions, as it is for them to finally arrive at an appropriate solution.

In problem solving situations, it is frequently necessary to derive so-called wrong answers in order to come up with right answers. As raw data are discovered, examined, rejected, and assimilated, a number of wrong answers may be absolutely essential to ultimately arrive at a workable solution. It is also

true that there may be more than one workable solution – more than one reasonable response – more than one correct answer. Outdoor environments seem to provide the time and the space for students to learn from their mistakes.

Outdoor education presents educators with an instructional media through which students may experience for themselves the processes of scientific inquiry and problem solving. In this kind of learning environment students soon discover that all knowledge does not come from the book. We learn, furthermore, that there are few finite answers to anything.

In his book, CIRCLE OF THE SEASONS, Edwin Way Teal tells how for a number of years he pondered the question, "Can a Dragonfly fly backward?" A quick initial observation had suggested this possibility to him. However, he wasn't convinced. There was always the possibility that the dragonfly was being carried backward on the breeze. He found the evidence he needed. However, when one day he observed dragonflys moving backwards against the breeze, Teal went on to make this observation: "You can prove almost anything with the evidence of a small enough segment of time. How often in any search for truth, the answer of the minute is positive, the answer of the hour qualified, the answers of the year contradictory."

The third commonsense element of outdoor education that we will mention briefly is this: extending the instructional setting beyond the school places the learner in an environment where he may respond with his total being. . . . .his body . . . . . his mind . . . his spirit. The learning organism is being bombarded with multiple, sensory stimuli not ordinarily found in the classroom. The learner responds as a total organism with motion and emotion. . . . . with thought and with feeling. . . . . and in ways only known to himself. It may well be the thought and feelings known only to oneself that are of the highest value to an emerging, developing, self.

In closing, I will leave you with this thought of NIETZSCHE'S, which I have paraphrased slightly. Writing on "the future of our educational institutions," he said:

"The woods, the rocks, the winds, the vulture, the flowers, the butterfly, the meads, the mountain slopes, must all speak to us in their own language: In them we must, as it were, come to know ourselves again in countless reflections and images, in a variegated round of changing visions: and in this way we will unconsciously and gradually feel the metaphysical unity of all things in the great image of anture, and at the same time tranquilize our souls in the contemplation of her eternal endurance and necessity."

I suggest to you that it is just as vital for today's youth, as well as for our own generation, to come to know ourselves. . . . . to be able to tranquilize our souls against the seemingly endless pressures of modern society, and finally, to recognize the ultimate endurance of the environment in which we are after all an inescapable fragment.

This article is adapted from the author's talk presented at the Fourth National Outdoor Education Conference in Gull Lake, Michigan on October 1970.

Scientific inquiry and problem solving

BASIC CONSIDERATIONS FOR OUTDOOR EDUCATION

By: Dr. Thomas J. Rillo
Professor of Environmental Education
Glassboro State College

For almost three decades outdoor education has been or become a part of the educational system in many communities. With varying enthusiasm, and success, many school systems have experimented with programs designed to convey classroom teachers, students and resource materials into the out-of-doors. Emanating from the classroom, outdoor education programs have begun just beyond the classroom walls. They have taken place on the school steps, the sidewalk, the school yard, a nearby park or in the community. Outdoor education programs have been conducted for as short a period as five minutes, a half hour, an hour, half day, or full day. In many programs, the short period of time on the school site or full day in the community has been extended to longer periods of time away from the regular campus. Frequently, this has included a full week in which the class is away from the school, living and learning together in the environment of an outdoor education resident center. Regardless of the degree of extensiveness of the outdoor education programs, the key to satisfaction and success in learning out-of-doors is vested in the enthusiasm and interest of the classroom teacher. The degree to which the program is related to the interests and needs of the student, and the degree to which the students themselves share in its planning, is dependent not only upon the educational philosophy and policy of the school system, but also upon interest, support and preparation of the classroom teacher.

The responsibility of preparing teachers to utilize the outdoor environment whenever it is feasible and right to do so is clearly that of the colleges and universities. The paucity of confident, devoted, and competent teachers who can approach the teaching opportunities of the out-of-doors with security is not necessarily a reflection of the public school systems. Colleges and universities involved in teacher training often do not meet their responsibility in educating generally competent persons for teaching in the out-of-doors.

It is not intended to infer here that a person should not be prepared to teach in the classroom. This should be the first responsibility of any institution involved in teacher education. However, there are concepts in any discipline which can be further enhanced through firsthand experiences. Some of these basic concepts can be amplified in a meaningful context through direct experiences in the outdoor environment. Teachers should be aware of the many opportunities inherent in the outdoor environment leading to the optimum learning of certain concepts. This awareness can best be sharpened by previous experience. These experiences should be made available to every prospective teacher by the college or university.

The simplest definition of outdoor education is one that has taken many years to evolve. The words may be plain and simple, but they take on real meaning through experience, evaluation, and understanding. This definition has been stated by the late Dr. Lloyd Burgess Sharp, national authority on outdoor education:

> In simple terms, outdoor education means all of that learning included in the curriculum in any subject matter area and at any grade level which can best be learned outside the classroom.

This definition has definite implications not only for the methodology of outdoor teaching, but for the preparation of teachers as well. It implies that outdoor education is not an added subject in itself and it should not be considered as a separate department. Subject matter, therefore, must be divided on the basis of where the desired learning can most effectively take place – inside or outside of the classroom. Subsequently, then, outdoor education becomes a setting for learning where the keynote is efficiency. It is an environment where learning can take place rapidly, is conducive to greater

retention, and promotes increased interest, understanding, and appreciation through direct involvement. The basic steps of effective outdoor learning are observation, reflection, and research. Direct observation arouses interest, curiosity and desire for investigation. The desire for learning then becomes important and significant to each individual.

A basic principle evolving from this definition is that it is not necessary to be a naturalist in order to extend education into the out-of-doors. Too many teachers insist that they are not competent enough to teach in the out-of-doors. They seriously think that one has to be a naturalist, geologist, botanist, zoologist, herpetologist, ornithologist, ecologist, conservationist, or scientist before assuming the responsibility of working with their students in the out-of-doors. This is not necessarily so although it would be wonderful to be all of those professions previously listed. Realistically, this is not possible. The teacher's lack of the technical background inherent in these professional fields should not prevent a class of children from having direct experiences in the outdoor environment. This is, of course, dependent upon the aims and objectives of the outdoor education program. If the aims and objectives are structured for the assimilation of technical knowledge, then a technical background in the leader will be necessary. If the program of outdoor education emanates from the classroom as a result of felt needs on the part of the teacher and the students for greater understanding and appreciation of basic concepts, then the background should be vested in adequate preparation cooperatively. The outdoor activities subsequently should be correlated with the classroom work.

The framework of procedure which would encourage more teachers to use the outdoor environment whenever feasible would be the following: establishing the aim of the outdoor experience, organization into small groups, method, leadership preparation, resource and reference materials.

Aim of the Outdoor Education Experience

The total experience in the out-of-doors has its own aim. It is exceedingly important to define the goal or purpose, and also to understand that there is a difference between objective and aim. Aims or goals point the way. They are ideals and may not or need not be measured. They can be and should be clearly stated for the outdoor education experience. An objective is a tangible, a specific and definite mark, measurement or mile post along the way. Objectives in reality

constitute the planned happenings in an outdoor education program and they should be measured.

Not only is there an objective and goal for the curriculum of a school as a whole, but the individual facets of the curriculum each have objectives and goals. Outdoor education programs are no exception. If outdoor education is an integral part of the total curriculum, then aims and objectives are definitely necessary. Aims and objectives should be stated in terms of the type of outdoor experience in question. Programs need not and should not be the same. They are often different and, therefore, their aims and objectives and, in particular, the procedures should and do vary. Each teacher and class should visualize their own course. In the end, all should arrive at the common purpose of effecting efficiency of learning in each student. The success and value of outdoor education should be measured in terms of the benefits to each individual student.

Aims and objectives clearly stated and involving the teacher and class cooperatively will certainly have implications for the methods employed.

Organization into Small Groups

If the aim of the outdoor experience is integrated into each phase or discipline of the total curriculum, there should not be a separate period for each activity. The very word department or activity signifies a type of segmenting program phases. The outdoor education experience should be interdisciplinary in approach. It should be flexible enough to enhance the concept of the interrelatedness of the physical world. The outdoor experience should also provide direct experiences for each individual. Methods should be used for efficient learning in an outdoor environment where the climate is conducive to firsthand experiences. The small group, therefore, becomes the most potent force in the educational process of the outdoor classroom. The individual is the first one concerned in the total learning process in the out-of-doors. Whatever happens to the individual and what changes are made in his behavior, in his understanding of the natural environment and in his relationship to others come as a result of a learning process.

Too much of our education is done in groups so large that the individual is lost. It is important in outdoor education programs that the group is of such size and complexity that each individual will have the most favorable opportunity to attain the greatest and most wholesome development within the time of his outdoor experience.

Greater use of the five senses can be made when the group is small enough. Every member of the group should have the opportunity to touch, smell, hear, taste, and see in the learning process. They should have the opportunity to manipulate, to have for their own use, tools of research in the out-of-doors. Learning by discovery is most appropriate for outdoor education experiences. Discovery can be of two types – what one is looking for directly and what one may not be looking for at all. In outdoor education, many questions arise concerning the methodology of learning through discovery. There is the question of how much should the teacher tell the student and what should the student discover for himself? Another question is just what are the powers of self-discovery among students? These are difficult questions to answer. It has been said that eighty per cent of the questions raised by students can be answered by themselves and twenty per cent of the questions need assistance.

But no matter what the final answer may be, we should give all students the opportunity to test their ability to arrive at answers for themselves. Students must be faced with real life problems which will cause them to apply the method of problem solving. In many instances, they already have the knowledge with which to solve the problem. Certainly in the outdoors much of the data needed for problem solving can be attained through the multi-sensory approach. This means direct involvement in the accumulation of data through the senses. The most efficient way of insuring that each individual becomes involved is through the small group organization. One individual cannot learn for himself.

Small group organization in the out-of-doors will require strong leadership and many teachers may not be prepared to do it. Very often they have been prepared for telling and reciting, not for maximum student involvement. If efficiency of learning is a keynote of outdoor education, then the small group organization is a prerequisite.

Method

The important thing in outdoor education methodology is knowing how to arouse curiosity. Knowing the answer is the last thing. A teacher will never have to know technically the answers to all the questions asked during an outdoor experience. Many answers to what students want to know are contained in textbooks. They have been recorded there by persons who learned them through discovery. The thrills, excitement, and self-satisfaction of the firsthand experience belongs to the authors. Unfortunately, the source of much of what a student learns is secondhand to him. The method of learning was far more significant and meaningful to the author than it is to the reader. Method then becomes more significant in the overall point of view than factual information.

This is true mainly at the outset of the process of learning and does mean that the end of learning is method only. Knowing how to find facts is important and having the courage to say you do not know is also important. It was previously stated that eighty per cent of the questions raised by students can be answered by them through the knowledge of knowing where and how to look. When students are curious, a teacher will need to have resource material available to answer the questions immediately. In the out-of-doors, provision should be made for books and resource material to be at hand whenever questions are raised.

Students should answer their own questions as far as possible. One resource is books and materials and students should be taught how to use them. If teachers want students to learn, they have to arouse curiosity and give them the resources to learn. We are long in telling and short on arousing

curiosity. How to find out what is not known is the important thing. To lead students to discovery by questioning rather than by telling has been proven to be most effective both in the classroom and in the outdoor laboratory. How to ask a good question is more important than telling the answer. The end is in the grasp and understanding of specifics. Method plays a vital role in how to arrive at the answer and whether it is appreciated and retained most efficiently.

In outdoor education, learning by discovery is a search for new meanings, for developing concepts drawn from concrete experience. This is not unique to outdoor education for it is deeply rooted in established principles of education. Learning by discovery through direct experience is not new. Three hundred years ago Comenius wrote that his objective was "to seek and find a method by which teachers teach less and learners learn more." Outdoor education is just another educational setting among other experience settings concerned with a procedure through which the student learns to find out things for himself.

Leadership Preparation

Outdoor education can never completely become an integral part of American education until teachers are themselves introduced to the possibilities. Studies show that students in teacher education institutions have a surprisingly narrow background of outdoor experiences upon which to base their teaching careers. Even more surprising is the lack of provision in the preparation programs to give these experiences. Not only should teachers be taught how to use the out-of-doors, but also they should have the personal experiences that grow out of outdoor teacher education experiences.

Colleges and universities need to accept the responsibility of making it possible and likely that teachers will employ outdoor education experiences as an important component of the school curriculum which they operate. Outdoor teacher education programs at the college level should provide for the full recognition of the teaching possibilities in the out-of-doors. These programs should enhance faith in the essential importance of direct experience as an educative medium. Prospective teachers and inservice teachers should have the opportunity of enrollment in courses which will provide insight into concrete ways in which outdoor experiences may make unique contributions to achieving curricular objectives with a greater degree of efficiency. The preservice and inservice preparation of teachers should include opportunities for the development of professional excellence in employing real problems as the center for permanent teaching-learning. Field experiences out-of-doors conducted by colleges and universities should provide for the preservice and the inservice teacher, opportunities for the development of competence in conducting group learning out-of-doors.

Desirable advances in programs of preservice preparation of teachers should include the introduction of outdoor education as a universal experience for all students and equipping and predisposing them to employ outdoor education in their regular teaching assignments. Outdoor education then should be introduced into the professional sequence for teachers. Colleges and universities should provide apprenticeship teaching in situations in which outdoor education is being used naturally and well. This practicum in outdoor teaching should be scheduled prior to student teaching and would provide the student an opportunity to experiment with methods and techniques of teaching he has studied in the more formal atmosphere of the college classroom.

Outdoor education has become too important a component of the total curriculum to be neglected any longer by the colleges and universities. It has become just as important for the college or university to prepare a prospective teacher to teach outside the classroom as it is to prepare them for teaching in the classroom.

Administrators of public school systems, interested in outdoor education, are seeking help from the institutions that supply them with teachers. The responsibility of preparing leadership for outdoor education is clearly that of the universities and colleges.

Reference and Resource Materials

The various types of reference and resource materials have a definite place in connection with outdoor education, but they also present dangers. These dangers can be avoided only if there is a proper recognition of the relationship among reading, observation and experience. Reference and resource material will have educational value only to the extent that it causes students to grow in understanding and skills with the result that they can better solve the problems that surround them. Properly used reference and resource materials can help to achieve the educational objectives of the outdoor education program.

Adequate libraries ought to be available both at the outdoor education center and in the field. Books should be accessible for the reinforcement of observed data. They should help the student to organize into meaningful wholes certain experiences that because of their nature cannot be completely realized without research or follow-up. The school library or the classroom library should contain reference materials, books, resource materials, pamphlets, and periodicals pertaining to the extension of learning in the out-of-doors.

It has been stated that the three steps of outdoor education methodology are observation, reflection and investigation. It is definitely for the third step of investigation that reference and resource materials are needed. These materials when properly utilized will give students access to what is already known. The outdoor experience should serve to stimulate the mind and the imagination and the reference and resource materials should serve as orientation to new knowledge and the systematizing of what has been learned from direct experience. The bulk of the learning would still be carried on in the classroom.

A relatively recent development has been the utilization of mobile educational trailers or van type vehicles. These small

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City Kids and Trees

By: Dr. Eugene M. Ezersky
Director Environmental Project
Educational Facilities Laboratories, Inc., N. Y.

In environmental education we are suffering from a terminology lag – the labels are ten years ahead of the program.

From my vantage point, the key element of environmental education is that it reaffirms the primacy of man; that it is equally concerned with protecting children from the rat infested garbage heaps in which city kids play as it is with saving the redwoods; and, most importantly, that it recognizes the relationship of each to the other.

Have we identified a sacrosanct segment of our natural resources for protection – trees, rivers, fish – while overlooking and minimizing the need to protect, with even greater fervor, our primary resource – human lives? There can be little doubt that man is endangering his environment. But there is little doubt that equally, the environment is endangering man.

Some of our environmental protection practices almost scream of the expendability of human life . . . and give pause to reflect on the question of whether our priorities are sacrificing human ecology for other ecological benefits. As Philip Hauser stated, "Despite the views of the overall environmentalists (perhaps this is a poor word – maybe he meant conservationists), it is more important to eliminate the Chicago slums than to clean up Lake Michigan."

Saving the Children

The most immediate ecological priority must be saving a whole generation of children who are presently growing up in the poverty ghettos of our cities and urban centers or in the blighted bleak pockets of depression spotted around our country. Just as surely as there is pollution of our rivers, there is pollution of the human spirit. Just as surely as there is pollution of our air, there is the crushing, debilitating pollution of human character. Just as important as it is to save our trees, it is more important to save our children. The absence of the natural products given off by the forests and trees can result in the destruction of our cities and even worse. But poverty children locked into a bottomless pit of degradation with no hope of escape will produce children whose violence and frustrations can more dramatically and perhaps even more permanently destroy our cities.

What are we saying to ghetto kids when they see this evangelical outpouring of effort to save a tree? Are we saying that the tree is more important than you? What self-image does a child of Appalachia develop when dramatic stories and pictures abound of dying fish, when all around him he witnesses the day to day death of his community, of its people and its institutions?

A sensitive and concerned public cannot but be angered by the attention given to every conceivable aspect of environmental protection – except the protection of the environmental qualities which nourish our youth or, rather, which destroy him. An oil slick off the coast of California presents less of a threat in the eyes of a ghetto father than does a rat-infested garbage heap in which his children play.

We are suffering from a dehumanization syndrome. The human considerations of living have been subordinated to science and technology and to the expediencies of living. This suggests a serious distortion of our environmental priorities.

Urban Environmental Education

In dealing with the problems of urban living, with its man-made environment, it is important to recognize that we are dealing with separate and distinct problems from the usual ecological frame of reference, that of nature and conservation and the threatened species. City man must develop an understanding of his role in his partnership with other city human beings and city institutions before he can appreciate or even seek to understand his role in the overall scheme of nature.

The primary discipline in urban environmental education may very well be sociology rather than biology. Our considerations must be centered on the primacy of man – and of his relationship to man. Essentially our focus in the inner city must be on people rather than on rivers or trees, or mountains or even bricks.

Outside the city, when we focus on the solution to a specific ecological problem, such as clearing a river or a lake of pollution, the solution has immediate local positive effects as well as in the totality of regional ecological improvement. The kids and fathers can fish and swim, and the water is clean. Similarly, when urban citizens bring about the restoration of a block or a neighborhood, they must be able to sense the feeling of accomplishment and grasp the positive local effects as well as those to the overall community or city. The same interrelationships and interdependence exist in the wilderness or in the city, but the players on the grid and the immediate measures of success are vastly different. Importantly, however, the major goal is identical – the protection of the total human environment.

On the urban scene, we need a series of instant environmental gratifications, if you will, where these encounters operate within the framework of the everyday, frustrating problems of human survival.

What I am suggesting is that each school develop its environmental curriculum around those matters which are local and topical to them. There is then direct meaning to the pupils, success is easily identified; community cooperation and interaction is a natural by-product, and the benefits are thereby quite visible to the citizenry. Remote projects and theoretical concepts are not the peg on which local school systems should hang their environmental hats.

The areas to be attacked in the cities are almost too numerous to mention: housing, air pollution, waste disposal, degradation of recreation areas, transportation, noise, race relations, hunger, lack of opportunity to live a quality life. And they are all properly cradled in the environmental umbrella.

With the mandate of priorities and subject matter established, we need only to proceed. We have the emotional commitment. We now need intellectual and physical participation.

...then step aside

by Lynn Trimm
Early Elementary Department
Chatham, New York

"It looks like little stars."

"It doesn't make any noise when it hits."

"Snow tastes just like water."

"You have to wear mittens and that stuff."

"You shovel snow off the sidewalk."
"And the garbage can."
"And the roof."
"And the mailbox."
"I can't run the snowblower yet."

"Snow makes good tracks."
"And snowmen."
"And snowballs."
"And angels."

"You can't keep it in your pocket." (This remark and the above series indicate a connection between this snow and that of Ezra Jack Keats in "The Snowy Day.")

"Maybe we'll ride the snowmobile."
"And go sleigh riding."
"And ski."

"Snow covers things up."

"Fluffy is a good word."

I particularly enjoyed the conclusion to this seminar on snow. One youngster turned toward the warm indoors and said, "Let's keep some," then walked inside. (Translation: "Let me think about this awhile, sort out my feelings, and then I may or may not have something more to say."

Which is really the crux of my teacher tip for those of us in early elementary education. We are so beset with overviews, objectives, flowcharts, planning of essential and enrichment materials, that we may overlook the obvious. In the field of outdoor education nothing is more basic than the outdoors. And it is everywhere available for the five-year old to explore with all his senses. Simply use what *is*, respecting a child's right to sense, respond, question, comment, or even to "keep some." Let him do, so he will understand.

Having put learning in his way, the best tip of all is to step aside.

GETTING READY FOR THE NEW SCHOOL YEAR

By: Dr. Phyllis S. Busch

A child spends part of his day at school-as is required of him. He also spends a goodly portion at home-as is expected of him. At other times? OUTDOORS.

There are many reasons why he prefers to be outside. His friends are there and also, there is some freedom from restraint. The important point is that he is there and a good portion of the time, and wherever he is, that environment is part of his world. If teachers are trying to arouse and sustain a child's curiosity about his environment, are we not limiting ourselves by restricting the child's horizons to four walls? We need therefore to extend the classroom outdoors – to dissolve the walls and to embrace the whole environment. This precept is receiving general acceptance, at least in theory if not always in practice.

Teachers are gradually becoming accustomed to consider environmental education as part of the curriculum-hopefully, as a pervasive part of the curriculum, embracing all areas and not restricted to something taught so many minutes per week. To be so restrictive is ineffective, inaccurate, and unproductive of the aims of environmental education.

When the rationale for using the outdoors as a laboratory for investigation is agreed upon, there is always the anticipated and justified inquiry posed by teachers, "How?" To answer this the teacher must know two things: What is outside? What are the ways for utilizing these outdoor resources? How does one get ready?

Step number one is to make an inventory of the resources found outside the school. The second step is to learn how to make the most effective uses of these resources.

First take a stroll around the school building and close to it. When you return to the starting point walk around once more, this time about ten feet farther out. Spend a few days taking walks in ever widening circles, including as much of the neighborhood as is feasible. Keep a list of all the outdoor resources which you experience through your five senses.

You will probably end up with several hundred resources. Among them might be: a tree, weeds, grass, soil, gravel, concrete, pigeons, sparrows, gulls, police car siren, ambulance siren, traffic lights, factory smell, bakery smell, rain, parking meters, wind, clouds, supermarket, shadows, balloon, airplane, cockroach, squirrel, granite curb at edge of sidewalk, voices, etc.

Now examine the courses of study for your grade, paying special attention to science and social studies. Of course you are sure to examine your goals-how you expect the children to be different as a result of their experiences which you are helping to direct. You should also decide upon what criteria you will use to detect any degree of achievement toward these goals. Hopefully these criteria should reflect a search for evidences of a growing awareness of the world around us, evidences that the children feel the need to learn more, evidences that they are developing a feeling of responsibility. And if the teaching is really successful there should be some indications of a desire to become involved actively in environmental problems, appropriate of course, to the age level of the children with whom you are working. Finally, there should be some action of some kind.

Having completed, then, your list of resources, knowing your goals, and having some idea of how you might recognize growth toward their attainment, you are ready to make use of the outdoor resources in your teaching.

You might prefer to list each resource on a large file card and add ways and means of utilizing each. A curriculum is an ongoing, never-ending affair, and you have already begun.

Suppose we take one example, the resource, pigeons. They are to be found everywhere. You know where in your neighborhood these birds appear. Many investigations can be made, and these cover different parts of the courses of study.

How many pigeons are there on a given day?

Is the number the same each time that you go out?

Is there any variation in number at different hours, in different kinds of weather, at different times of the year?

What are the colors of pigeons? How are they different from each other?

How do they walk? Eat? Drink?

How are the males different from the females?

What kinds of sounds do they make with their mouths? With their wings? When do they make these sounds?

Pigeons are not native. Why are they so successful?

Why are these "immigrants" considered to be unhealthy?

Should something be done to limit their numbers? What?

And many, many more investigations are possible.

Any of these questions might be the motivation for a lesson, and the need for an investigation can be discussed. Then plan the details of the investigation. The next step is to go out and carry through what has been planned. Very often five to five to fifteen minutes will be sufficient for gathering the data needed. Help the children to bear in mind what they are trying to find out. After the experiment or observation is completed, the class returns to school inside.

Review the purpose of the trip, and proceed to go over the results. The interpretations may indicate further investigations outdoors, or indoors.

Briefly, then, this "indoor-outdoor" approach to environmental education should contribute to pupil awareness that man has made and is continuing to make many changes in his environment; that these changes have consequences; that such consequences are often not for the best; that much can be done by each person at each age level toward improving something in the environment, as well as preventing some forms of deterioration.

However, such goals can only be achieved if the outdoors is used frequently and if the teacher knows what is outside as well as how to use what is there. This is accomplished by taking time and getting ready for the new school year.

PROFESSIONAL PREPARATION IN OUTDOOR EDUCATION
IS IT REALLY NECESSARY?

By: DR. DONALD R. HAMMERMAN
Chairman, Outdoor Teacher Education
Northern Illinois University

In 1971, Russel Bachert, an NIU outdoor teacher education graduate, conducted a survey of degree programs related to Conservation, Ecology, Environmental Education, Environmental Science, Outdoor Education and Natural Resources. One hundred twenty-seven institutions responded indicating they do offer undergraduate or graduate work in these areas.

As one might expect in light of the attention being given to environmental quality these days, a number of institutions have newly developed programs related to environmental education, environmental studies, or the environmental sciences. For the purpose of this article, however, the data have been limited to those professional programs identified specifically as outdoor education.

Nineteen institutions offer a B.A. or B.S. degree related to outdoor education. Patterns are: a Major in (1) elementary education, (2) secondary education, (3) recreation, (4) physical education, (5) resource management, (6) recreation and parks administration, (7) agriculture, (8) conservation and outdoor education with either a specialization, or emphasis, or concentration in some form of outdoor education. These variations include: (1) an Emphasis in Outdoor Education and Camping, (2) a Minor in Outdoor Education, (3) an Option in Camping and Outdoor Education, or (4) Concentration in Outdoor Education.

Twenty-one institutions list graduate degree programs related to outdoor education, most at the masters degree level. Again, there are variations on the theme. For example:

(1) General Studies and Outdoor Education

(2) Camping Education with Specialization in Outdoor Education

(3) Curriculum, with Emphasis in Outdoor Education

(4) Conservation and Outdoor Education

(5) Recreation with an Option in Outdoor Education

(6) Camping and Outdoor Education Administration

(7) Recreation with Emphasis in Outdoor Education, Conservation, or Nature Interpretation

(8) Interdisciplinary Masters Degree in Outdoor Education

(9) Recreation and Park Administration with Emphasis in Outdoor Education

(10) Natural Resources, Conservation and Outdoor Education, Emphasis in Camping and Outdoor Education

(11) Outdoor Teacher Education

Beyond the masters is a Certificate of Advanced Study with Specialization in School Camping, and beyond that, various doctoral programs. Six institutions reported programs at the doctoral level. These are Ed.D., Ph.D., and Re.D. programs, again with various majors:

(1) Curriculum with Emphasis in Outdoor Education

Photo by: Lionel Atwill

(2) Recreation with Option in Outdoor Education

(3) Physical Education-Recreation with Specialization in Camping, Outdoor Education, and Outdoor Interpretive Services

(4) Outdoor Education and School Camping

(5) Camping Education with Specialization in Outdoor Education

(6) Conservation and Outdoor Education

Whether or not one goes the major, minor, area of emphasis, separate department, or interdisciplinary route, the by far more intriguing question is: Is professional preparation in outdoor education really necessary? Obviously, a number of colleges and universities have already answered this question in the affirmative.. The fact that thirty-one institutions throughout Canada and the U.S. do offer undergraduate and graduate programs of one sort or another in outdoor education is a fairly positive response to the question: Is professional preparation necessary?

Does the need for professional preparation in outdoor education actually exist? Ideally, it should not, for it should be part and parcel of every teacher's professional preparation. In practice, however, the need apparently does exist, otherwise the number of institutions that have developed areas of concentration, areas of specialization, majors, minors, and so on would not have gone that route. Ideally, professional preparation in outdoor education should be incorporated into all teacher education programs as an integral component of that program. To my way of thinking this would be a higher level of development than establishing it as a separate area of specialization.

To lend further direction to this consideration of the philosophical question: "Is professional preparation in outdoor education really necessary?" Let us consider the following additional questions:

(1) Does today's teacher require specialized skills to carry on the instructional program outside the school?

(2) Is the process of learning outside the classroom significantly different from that of learning in the classroom? Is the stimulus different?

(3) Are the modes of acquiring knowledge or of inquiry different?

(4) Is the learner any different outside of school than when in school?

(5) Is the role of classroom teacher as a facilitator of learning any different outside the classroom?

Obviously, these questions are interrelated and, while for the purpose of this article we may consider them separately, in theory each of the points discussed must fit together into a wholistic conceptualization of professional preparation. So, let us consider these questions, not necessarily in the same order,

Photo by: Norman Skliar

keeping in mind that while we treat them separately they are all connected and part of a larger whole . . . which is the point we ponder: Is professional preparation in outdoor education necessary?

The first question: Is the process of learning outside the classroom substantially different from that of learning in the classroom? Why should it be? In fact why should we ever separate the processes of learning according to where it is occurring? I suspect that strategies for learning such as problem solving, the discovery approach, exploratory learning and the like can be applied just as effectively in the classroom as beyond it.

I believe it is just as great a challenge to motivate learners indoors as out-of-doors. A teacher should be able to exercise every bit of imagination, and skill, and creativity that he possesses to motivate his students and to facilitate their learning no matter where he is teaching . . . in the classroom, or elsewhere.

My answer to the question: Does today's teacher require specialized skills to carry on the instructional program outside the classroom would be a heretical "No." They should not be perceived as specialized skills in the first place, but as skills that every competent educator should possess.

The second question: Is the stimulus different? Ideally it should not be. In practice it would appear to be. Classroom stimuli typically consist of the written or spoken word, charts, pictures (moving and still – each one worth a thousand words we are told), diagrams on the chalkboard, plus the interplay that, if allowed, can take place between minds.

Photo by: Norman Skliar

Photo by: Norman Skliar

Out-of-classroom stimuli typically consist of things manmade and natural, growing and non-growing, natural processes – static and dynamic. Out-of-classroom stimuli fortunately seem to lend themselves more to the processes of inquiry, firsthand observation, exploration and discovery, problem solving and synthesis.

This sort of comparison may well be an inductment of the relatively stifling learning atmosphere which typifies much of what comprises "school" these days when contrasted with much of what typifies out-of-classroom studies. The "open school" or "free school" movement has coined a phrase, "the trouble with school is schools." Yet to the credit of the schools and school people is the fact that they are searching for alternatives. It seems to me that what we have come to call outdoor education emerged on the school scene partially in response to a search for viable alternatives in education.

The third question: Is the learner any different outside of school than when in school? Unfortunately, he often seems to be markedly different. Observe youngsters when they are let out of school. They hop, skip, trip lightly, and literally jump with unbounded joy. Now obviously a good deal of this unbounded-joy-manifestation may be the natural physical reaction to being able to stretch and move with relative freedom after having been confined to ones' desk for a period of time. A hopeful sign is the recent development of the open school concept in the form of learning resources centers within a building which does allow children to move about more or less freely while they study.

None-the-less, the learner outside of school does appear to be more self-directed . . . more inclined to pursue a problem or a project with a bit more zeal than he directs to his classroom studies. Could it be that what exists outside of school is inherently more interesting to investigate than what exists in the classroom? What exists in the classroom that is worthy of study?

What exists in the classroom is more often than not, secondhand sources of information to be tapped by the not-so-eager learner. What exists outside the classroom is most often the stuff of the "real world," whatever that is. In-school subject matter does appear to suffer by comparison when balanced against that which can be investigated outside the school.

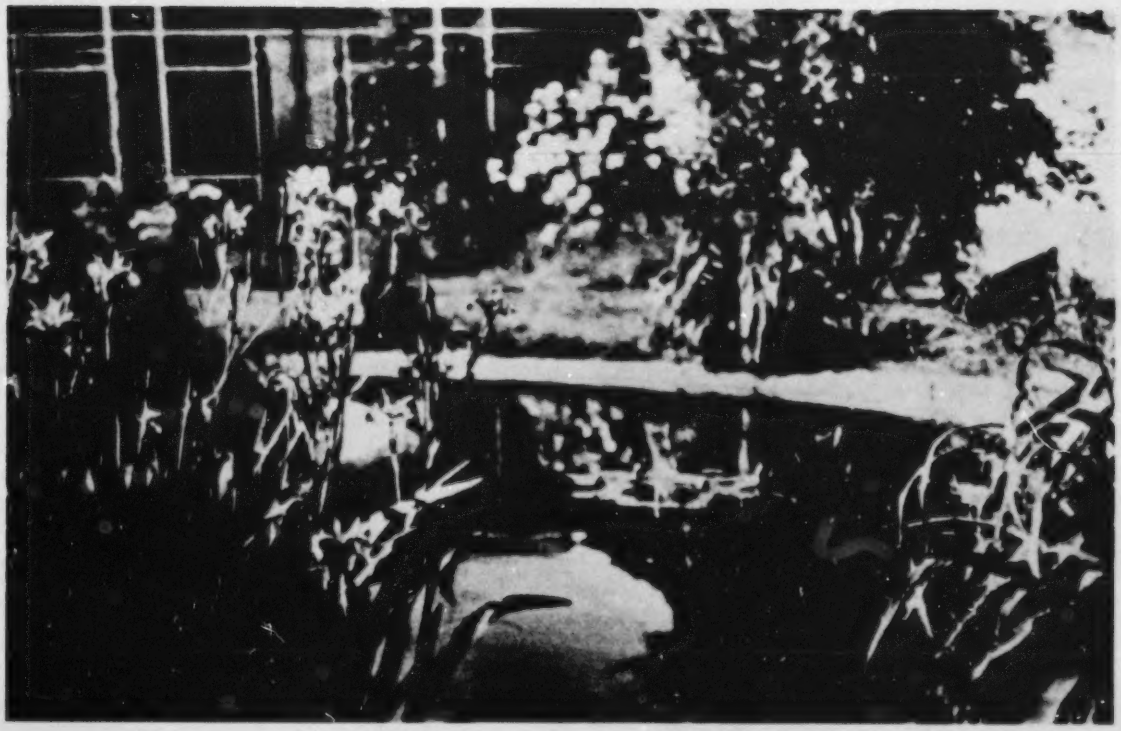
The fourth question: Is the role of teacher as facilitator of learning any different outside the classroom? Should it be? Of course not. The teacher as a facilitator of learning should be able to function effectively in any number of different learning environments whether they are inside the school building or in the larger classroom of the community, and beyond. This thought is related to the concept of extending education into many facets of community life, and into a variety of instructional settings.

Paradoxically, however, today's teacher is prepared primarily to function in a school building. Notwithstanding, the fact that today we are living in, and youngsters are learning in an expanded and ever expanding world. Children of yesteryear learned in a relatively circumscribed learning space. Today's learner, by comparison, through the advantage of advances in various media, can visually travel the world and the solar system. We are today much more citizens of the world.

Today's professional preparation, therefore, should include subject matter and strategies that will enable educators to draw upon instructional resources that exist *in the world beyond the classroom.* And I am not referring to the preparation of teaching specialists in something called outdoor education, but rather of preparing every teacher to be a kind of universal educator so that he is capable of carrying on the learning process in any number of learning environments: in school, standing in front of the chalkboard – out-of-school, standing on a street corner in mid-town Manhattan . . . or exploring a dried-up creek bed . . . observing in a city park . . . standing in a darkened spot at night and finding ones way among the constellations . . . following the tracks of an animal across a snowy field to its burrow . . . tuning in to the music of the spheres beside a gurgling brook . . . in a word, *functioning* as a teacher *in* the world rather than isolated *from* the world. This I believe is the crucial mission of professional education today, and to bring it about may well call for a change in the mind-set of what traditionally comprises professional preparation. But that's the name of the game – change. This means that institutions of higher learning need to be expanding their walls to include all kinds of out-of-classroom studies as an integral part of professional education.

St. Bernard de Clairvaux wrote, "Believe one who knows, you will find something greater in woods than books. Trees and stones will teach you that which you can never learn from masters." As professional educators we have become *too bookish* and have lost contact with the substance of *what is real.* It is this contact with firsthand experience that we need to reestablish as an essential component of learning at all levels.

This article was adapted from a presentation delivered to the Canadian International Conference in '72.



Development of an Ecological Laboratory

Text and Photos By:
Joy Squires and
Arthur J. Bunce

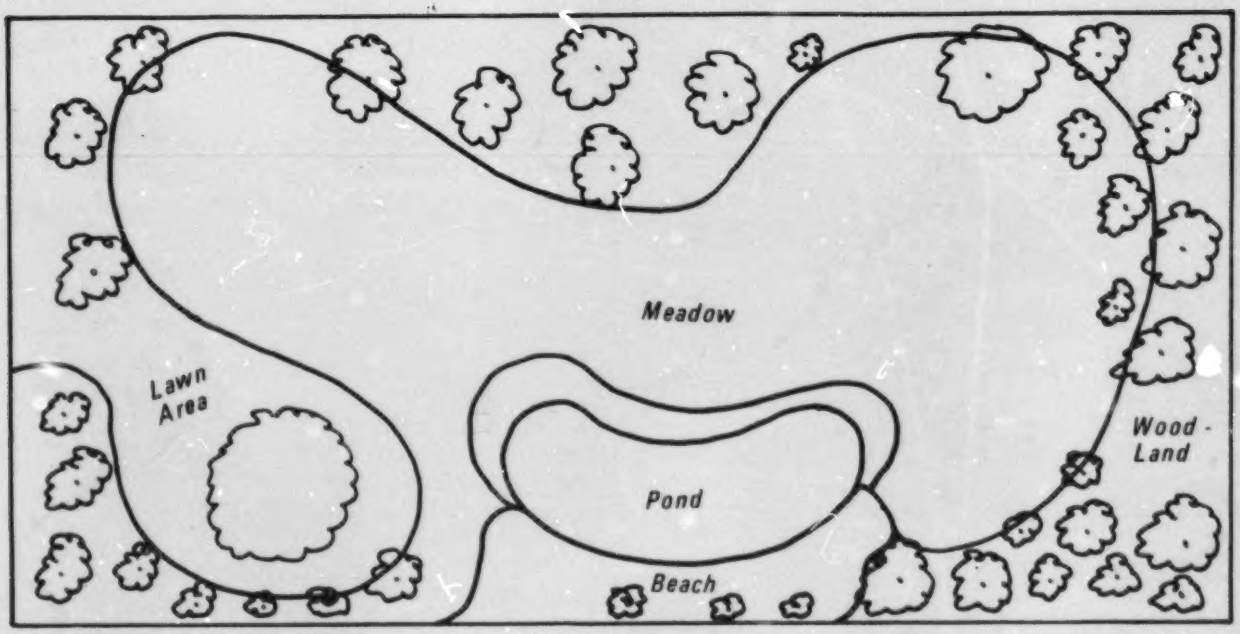
The Harley Avenue School area of Elwood, Town of Huntington, Long Island, is a typical suburban community of fertilized, manicured lawns and carefully tended shrubbery - completely remote from the realities of a nature left to its own devices. We felt that our children needed a much wider understanding of natural processes and progressions in order to appreciate the basic ecology of our planet.

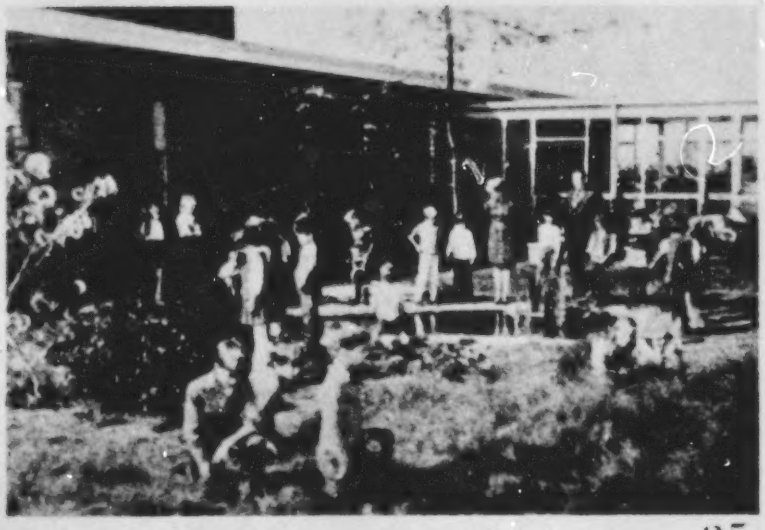
To satisfy this need we decided to build a living ecological laboratory in the courtyard of Harley Avenue Elementary School. We hoped to reproduce, on a miniature scale, the major types of natural environment common to the Long Island area. In this outdoor laboratory we wanted students to observe and explore, at close range, the natural interaction and interdependence of living things, plant and animal.

We have found our Ecological Laboratory to be a continually growing, always challenging educational experience for its creators - students, teachers, and administrators. Deliberately seeded materials do not always grow; "sponsored" wildlife does not necessarily thrive; yet, this sometimes frustrating experience has brought continuing rewards.

In physical layout, the Laboratory is a 50 x 100 foot light court surrounded by classrooms, the library, and halls. Planting follows a natural progression of environmental conditions from pond and bog, through a dry meadow, to a surrounding woodland. In addition, the area contains a small dry sandy beach area, and a shaded lawn area to be used for outdoor group instruction.

The basic idea for the Laboratory was presented to the Administration and the Board of Education in March, 1970. With their support, progress was rapidly made on the pond installation. The irregularly shaped cement pond progresses from a depth of a few inches to four feet. The shallow portion provides an ideal area for shallow water plants and grasses, while the deeper part is adequate for wintering over of fish and turtles. In order to quickly establish a proper pond ecology, natural pond silt was





Harley Avenue Ecological Laboratory

brought in and used to cover the bottom of deeper areas to a depth of several inches. The pond was stocked with fish, several varieties of frogs, many, many tadpoles and eastern painted, spotted and musk turtles.

Bog conditions were simulated by planting varied bog plants in a narrow vinyl band on the east side of the pond. This area is periodically flooded by pond overflow.

As the pond was completed, student excitement mounted, as did desire for direct participation. The need for large plant materials was solved by involving students on each grade level. Each grade chose which trees or shrubs they wished to purchase and plant. Younger children brought in nickels, dimes and quarters, while the upper elementary grades raised a considerable sum through cake sales and a white elephant sale. As a result of these efforts, dogwood, birch, shadbush, vibernums, bayberry and laurel were planted primarily in the woodland and meadow areas.

Funds for further planting and maintenance have been made available yearly through PTA support. Community involvement has extended beyond funding to participation in planting. The Laboratory provides a

"The area particularly lends itself to the spirit of discovery"

common bond for people on the staff with special interests in conservation education, scout troops and leaders, and parents who wish to contribute to the total development of the ecological area.

Resource people were, and are, readily available for technical advice and assistance. Our school sought the help of representatives of the New York State Environmental Conservation Department, local conservation education specialists, the local representative of the Soil Conservation Service, U.S. Department of Agriculture, the National Audubon Society, Long Island Nature Conservancy, and other nature organizations.

Several toads, box turtles and praying mantis were brought in by children. Stocking of the area with wild animal life was largely accomplished during the first year. This was especially true of the pond life which exists relatively independent of the other areas. Forest salamanders were held off until a good forest floor environment of leaf mold, dense shade, and rotted logs was assured. We succumbed to the great temptation, born of enthusiasm, to overstock. A pair of young cotton tails and a chipmunk exhibited voracious appetites and consumed wild flowers almost as rapidly as they were planted. Pigeons have been a constant problem.

Milkweed was planted to encourage monarch butterflies. We introduced some of the more intriguing types of local insects.

Quail eggs were provided by the Suffolk County Conservation Department. They were incubated, hatched and cared for by students with the intention of raising them for the Ecological Laboratory.

Our wood chip trails are the result of a successful Christmas tree recycling program sponsored by the Elwood Environmental Council.

Establishing the basic setting has been a three year project which breaks down roughly as follows:

First year: Detailed site development planning, construction of pond, stocking of pond with plant and animal life, planting of major trees and shrubs.

Second year: Development of lesser plantings, secondary shrubbery, wild flowers, grasses, additional wildlife, marking and completion of trails.

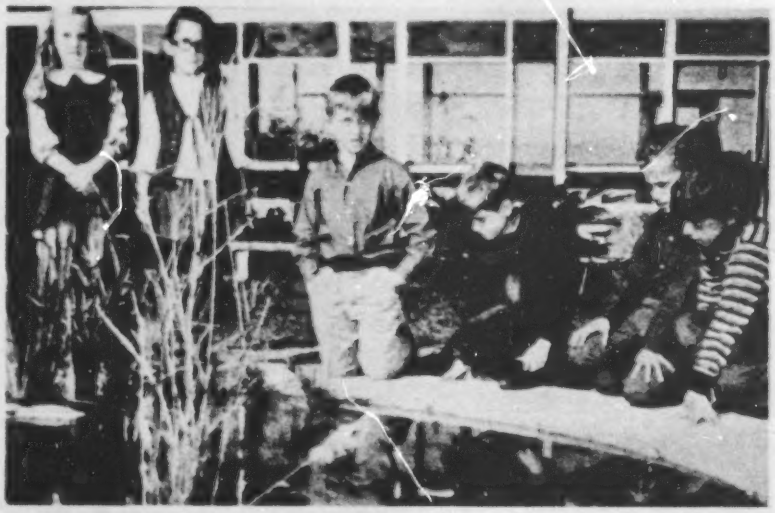
Third year: Cultivation and development of the more delicate specimens such as mosses, lichens and small forest plants.

Although a basic three year planting time table is suggested, it is necessary to spend additional seasons "fine tuning" this outdoor test tube to correct errors and achieve a proper balance. After planting, comes development of study aids, trail guides and appropriate curriculum aids. These should be developed through combined teacher and student experience and experimentation.

An important aspect of any outdoor education area is proper control and educational use. The small size of the Laboratory dictates that rules and regulations be followed. We consider the Laboratory a classroom, not a play area. A specific area is designated for group instruction, and use must be made of the trails to avoid destruction of plant and animal life.

Last, and most important is the question of how and what to teach in this facility. Effective utilization and development of areas of study require experiment and trial and error on the part of teachers. The area particularly lends itself to the spirit of discovery, characteristic of good environmental teaching. Our youngest children explore and observe phenomena that are new to them. Our older students observe interrelationships by actual experimentation. They frequently come away from this experience with facts and attitudes about their environment that are stimulating enough to encourage further study.

We feel that developing an ecological laboratory has been an exciting challenge. Our experience has shown this to be a way for an entire school community to study natural interactions in a convenient environment.



GET DOUBLE DUTY FROM NATURE TRAILS

By: James R. Fazio
Department of Natural Resources
Cornell University

When historians pass out plaudits for early efforts in environmental education, surely nature trails will be the winner. Not only are they one of our oldest outdoor teaching techniques, according to the National Audubon Society, they remain today one of the most popular features of nature education. Popular, at least, with visitors! As an educational tool for elementary and secondary teachers, they may well be the most under-utilized of any opportunity available for curriculum enrichment.

Traditionally, self-guiding trails have been used in national and county parks, national forests, and as regular fixtures at nearly all nature centers. Their purpose, of course, is to interpret the natural environment to visitors. In performing this function, they undoubtedly have done their job efficiently and with reasonable effectiveness.

But that is only half the value possible from interpretive trails. In fact, I am suggesting that the real educational significance of an interpretive trail is in its construction more than in its use by visitors after construction. A well-meaning teacher who designs and constructs a trail for class use is actually depriving his class of a large measure of the benefits he hopes for them to receive.

Quite simply, the greatest value of an interpretive trail is in having the students plan and construct it. When the project is complete, certainly other classes, groups or local individuals should be encouraged to use it, but at the end of the school year why not dismantle the signs or interpretive devices and begin all over again with next year's students? In this way the youngsters are genuinely involved in an "eco-action" project (albeit a public education effort), it facilitates self-expression through the design and creation of interpretive signs or devices, and it provides the teacher with a unique focus for environmental education efforts.

This concept is best illustrated by way of example. For this purpose I have outlined below a method tested last summer on 50 4-H boys and girls at Cornell University's Arnot Forest. The youngsters ranged in age from 14 to 19, with most being 15 years old. They were selected to attend the Natural Resources Teen Leadership Program by county agents who identified their leadership potential, but in a few cases "problem" youngsters were sent instead. Generally, the group's interests and abilities represented a cross section of New York's teenage population.

"Nature Trails" represented only one of several topics of major emphasis at the five-day camp. It was allotted two hours a day in the schedule for each of two sections containing 25 students. Therefore, all instruction was duplicated each day, except that this arrangement provided the opportunity to build two different trails; one to ultimately illustrate a "theme" trail (forestry, in this case), and the other to demonstrate a "general" trail. In both, relationships were stressed to help teach the concept of ecology, but on the theme trail all items were to include how forestry or land management was involved.

Here is the sequence of instruction which permitted the building of two trails from undeveloped land to finished product in five days. Bear in mind this is only an example. For application to your particular situation, any segment could and should be lengthened to fit your circumstances.

Session One: Introduction

The first day served as a dual introduction. First, the project was outlined in detail so each student would know what was expected of him and on what time schedule. Using slides, nature trails were discussed generally with illustrations of various interpretive techniques.

Professor Fred E. Winch, Jr. acquainting 4-H youngsters with their new trail area.

The concept of "interpretation" was stressed at the offset and compared with the interpretation of a foreign language--the natural environment being "foreign" to most visitors; the student having the task of "interpreter." Additionally, the importance of public education as an "eco-action" necessity was discussed along with the role of interpretive trails as one method toward that end. Thus, it was hoped to immediately establish a feeling of importance toward the project and dispell any "Mickey Mouse" connotation!

The second part of the first session was spent in familiarizing the students with the trail area. Because of the limitations on time, I had laid out the routes and marked them with plastic flagging. This could be done with the students but no two people would be able to agree exactly where to place the trail route and group involvement at this point could be more distractive than contributory to the educational purpose. Consequently, route selection may best be included as part of the teacher's planning activities.

Teaching "what's there to interpret" is little different than nature study activity that has been carried on by many schools for decades. In this project, however, it is a beginning rather than an end itself. This is also the point that may discourage many teachers who feel a lack of confidence in their knowledge of ecology and the natural environment. Consequently, it should be pointed out that we used the services of Professor Fred E. Winch, Jr. who not only is an outstanding field teacher, but illustrates what is meant by a "resource person". We attempted to stress that there are always local authorities who are glad to lend their expertise in identifying the various species and features along the trail.

Session Two: Researching

The second day began intense, individual involvement on the part of each student. We again went around the pre-flagged trail, but this time each student volunteered for a section to interpret. These trail sections had also been pre-flagged and were about 100 feet in length.

By the time we had completed the loop, there was strung out behind me a series of students each alone with his thoughts and his section of trail. I believe there is particular value in this experience, for how often are our students placed in this situation? There was no disciplinary problem, partially because of the group we were working with, but most likely because by this point each student knew what was expected of him and realized that time and knowledge limitations required the full application of his efforts.

Specifically, each student was to select one item on his section of the trail to interpret. Until I could make a second trip around the trail, he was to think about how he should attempt to interpret the object, the type of sign or device which could best do the job, and where exactly it should be placed. Then after I checked with each student to prevent duplication (surprisingly there was none), my approval sent him back to the library in the main lodge to research his item.

The "research" phase of the project provided an excellent way to introduce students to the basic "right hand" references of most naturalists. These included the Peterson Field Guide Series, Palmer's Fieldbook of Natural History, Comstock's Handbook of Nature Study and the 4-H booklet, Know Your Trees by Cope and Winch. St. Regis ad reprints, Conservationist center spreads and other appropriate literature were also made available.

From their library research, previous knowledge and Professor Winch's nature walk, the students were then ready for the next step. This involved condensing what they had learned about their items into short, concise, interesting, interpretive messages. These were then included in brief

Teaching assistant Kathleen Redmond supervising the polyester work area. This student is rolling out air bubbles in a freshly cast sign.

written plans showing not only the messages, but what material would be needed for each sign or device, its general size, shape and colors. Incidentally, all papers used in this phase were the clean sides of leftover sheets from mimeograph operations. This gave us the opportunity to add some thoughts on waste, recycling and environmental responsibility (see Teaching For Survival). A sample plan was posted on the bulletin board to provide added guidance.

Session Three: Sign Construction

During the evening following session two, each plan was carefully checked for technical accuracy and overall content. At the beginning of session three, the plans were returned, with written suggestions, and thereafter served as guides for sign construction.

Basically, materials for three types of interpretive signs were made available, discussed and demonstrated. Samples had been displayed earlier in the main lodge to enable the youngsters to consider each when making his plans. These were: wood; transparent, self-adhesive plastic; and polyester resin.

Use of these and other materials are discussed in Nature Trails: Guides to Environmental Understanding and Handbook of Skills for Preparing Trail Signs and Exhibits (presently being prepared for public distribution). Briefly, here are some of the things found in working with these materials under group conditions.

First of all, this part of the project proved highly popular with the students, many of whom returned in their afternoon free time period to work on their signs. Also, the absence of restrictions on creative expression and the opportunity to choose materials appeared to stimulate the production of diverse, interesting signs. All work in this phase was done in an outside teaching shelter divided into clearly designated areas for 1) supplies 2) artwork 3) polyester resin work 4) wood shop 5) painting and 6) woodburning. Organization plus one assistant were the keys to success! In a school situation, perhaps this is an opportunity to involve teachers of various disciplines, especially those of art and shop subjects.

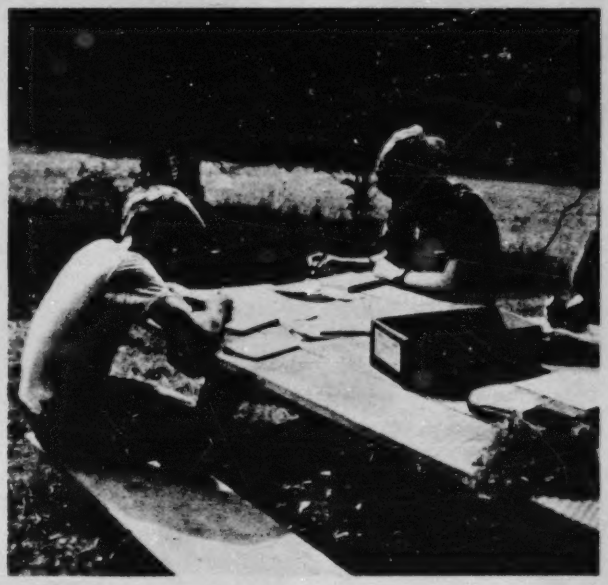
Wood: Three woodburning pens were made available for lettering, along with sanded, outdoor grade plywood for the sign. It is best to letter on the wood in pencil before burning. Provide metal ash trays as holders for the hot pens, and if working outside, don't overlook the necessity of electric outlets. Several wooden devices were also constructed, including a "tree namer" or "finder", and a box directing the visitors' gaze to a browse line created by an abundance of deer.

Self-adhesive plastic: Clear Con-Tact is the brand designation with which you may be familiar. These were the easiest signs to construct, inexpensive, and a summer of weathering has done them no harm. They consist merely of a paper sign sandwiched in a piece of the doubled over plastic. About an inch of margin gives added protection against rain.

A temptation is to use pages of a book or magazine, but this defeats the purpose of involving students in doing the interpretation. The only other admonition is to not use felt-tip pens in this or any outdoor sign. Except in rare cases, they are among the first art media to fade.

Polyester resin: As expected, working with this bio-plastic material was the most popular option. It also was the most expensive method, but produced tough, weather-proof signs which in some cases were close to professional quality. India ink, typewriter, ballpoint pen and press-on letters were used for the messages and a few students added illustrations or

Most of the work was done outside. Here one youngster is completing his interpretive message while two others letter with wood burning pens.



pressed leaves. A preservative spray (available in art stores) is a must before embedding in resin. The fumes of this material may be a nuisance indoors and close supervision is needed to prevent spillage, but in the Arnot program no major problems were encountered. The added expense to the program was more than compensated by the interest created by the polyester resin.

Session Four: Sign Completion

Polyester resin when pressed flat can easily dry overnight. Therefore, all signs done in this material had to be cast by the end of the third session. During the fourth, they were shaped with fine-tooth saws, drilled, and screwed to plywood backing which each student cut to size. Likewise, the other signs were completed in this period and all were erected in place on the trail.

Two problems were encountered at this stage. First, a production bottleneck occurred because of tool shortages. Next time: 1) each student will be asked to bring a screwdriver, 2) more fine-tooth saws and hand drills will be purchased for shaping and posting polyester signs, and 3) plywood sheets for backing will be pre-cut in various sizes to eliminate that step.

The second problem was with the sign posts. I insisted on posts because of a personal belief that labels and signs should not be affixed directly to the interpreted object. The posts we used were simply thick-and-thin cuts from waste wood at Cornell's demonstration sawmill. Similar pieces could be easily secured as donations from most other sawmills (peeled saplings make good substitutes with pipe clamps used to affix the sign backing to the post). The problem encountered was in having the signs erected firmly. Wobbly signs resulted from shallow holes and our mistake of assuming most youngsters would know how to plant a post! Next time: a demonstration in the use of appropriate tools and the compacting of soil and rocks to hold posts firmly in place.

A young trail visitor using a "tree finder." This ingenious device is useful in pointing out trees that are easily identified at a distance by some distinctive feature.

Cords and board feet were interpreted at this station. For sign backing, the youngster used a piece of wood actually measuring 1 board foot.

A step we omitted here in the interest of time was coating the signs with outdoor varnish. Time also prevented most other painting and the staining of sign backings. Both definitely should be included when the project encompasses a longer period.

Session Five: Review and Evaluation

The final day was spent touring the finished trail as a group and discussing each sign. This provided the chance to stress the good and bad points of construction and to reinforce the interpretive content. In addition, each student was asked to make a list of the three signs or devices he felt best exhibited the highest degree of imagination, effectiveness and workmanship. The "winners" on each trail received books during closing ceremonies at camp.

Miscellaneous Assignments

The above description of scheduling for the Arnot project would not be complete without mentioning two more important tasks. These involved the construction of non-interpretive facilities such as entrance and directional signs, bridges, benches, trail tread, etc.

On each trail the entrance and directional signs were done by a volunteer in lieu of an interpretive assignment. However, the student designed these signs, determined their best location, and was required to measure the trail length which was (and always should be) put on the entrance sign. In both cases the entrance signs were done by woodburning (one on the cross section of a tree). The directional signs used press-on letters and arrows embedded in polyester resin.

Probably in any group of youngsters there will be some who cannot be motivated toward interpretation per se. Trail tread and facility construction may be their niche in the project. At Arnot, we selected two youngsters on each trail from among the three or four who volunteered. Under the close supervision of teaching assistant Paul Sarokwash, these youngsters spent sessions two, three, and four removing brush, low limbs, exposed roots, etc., from the flagged route. Ledging side slopes, constructing rustic stairs and a simple stepping-stone bridge was also included among their "duties". Under proper supervision, this aspect of the project also can be a constructive, educational experience for selected students.

Conclusions

Student reaction observed throughout the project indicated a high degree of interest. Their interpretive messages were a clue to comprehension of the ecological information planned as part of the learning experience. This proved satisfactory and a much easier gauge than comprehension following, say, a nature walk. Finally their own verbal and written evaluations were considered important indicators of the project's success. These resulted in conclusive evidence that the project was at least well received and probably highly effective.

The advantages of involving students in the construction of interpretive trails are manyfold and far outweigh the problems. The exercise of individual responsibility within the broader framework of a total team effort is one of the evident benefits. Another is the unique opportunity to provide involvement and focus for lessons in ecology, history, social studies, art, shop and many others. Healthful physical exercise must be counted here also, to say nothing of lessons in citizenship as the youngsters are faced with prospects of vandalism and littering on their trail.

Their trail! Perhaps that was the true essence of this project's merit. It demonstrated a workable opportunity for genuine, meaningful involvement of students in understanding and interpreting their surroundings. While this has always been the goal of using trails, how much more valuable when actually creating them!

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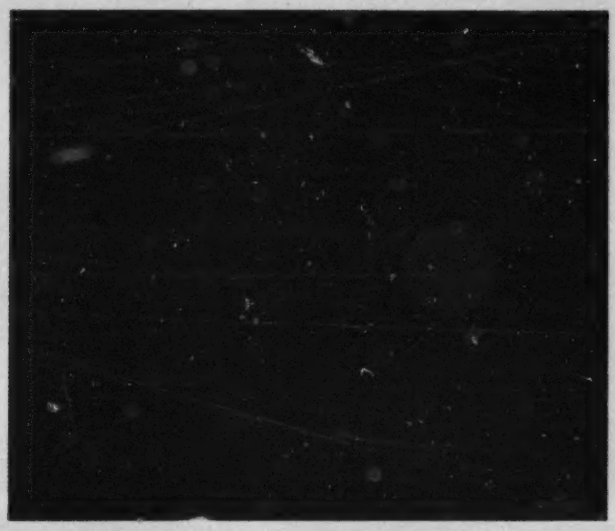


Signs of this quality would never be found in a national park! However, their educational value is immeasurable when considering the involvement of students. The one on the left was done by a city youth; the other by a young girl with serious problems and a tendency to withdraw from group activities.

THE MUTTONTOWN ENVIRONMENTAL PROGRAM

A

MODEL

IN FIELD

TRIPPING - DAY CAMPING

EXPERIENCES

BY: *Norman Skliar*
Nassau B.O.C.E.S.

Programs which provide direct involvement in the out-of-doors enable students to become sensitive to the interdependence that exists between man and his natural environment. This is an important step towards the development and inculcation of an "Environmental Awareness" necessary in today's world.

The Nassau BOCES Muttontown Environmental Program (also the Marine Ecology Environmental Program and other 'Naturalist' Programs not covered in this article) is designed to serve immeasurably towards achieving the above goal.

THE PROGRAM

The program is comprised of three parts:

I. Pre-Trip Planning and Activities
II. Field Experience at Muttontown Preserve
III. Post-Trip Teacher/Student Activities

PRE-TRIP PLANNING AND ACTIVITIES

Prior to the scheduled field experience, all teachers and other leaders will attend a pre-trip orientation briefing at the Muttontown Preserve. The Muttontown Preserve is under the jurisdiction of the Nassau County Department of Parks and Recreation, and consists of over 300 acres of natural land. It contains numerous ponds, a variety of forests, and great expanses of abandoned farm fields in a state of natural succession to climax forest.

B. Materials Available

1. A handbook for outdoor education on Nassau County Museum Preserves.
2. A Guide to Muttontown Nature Preserve.
* 3. Field Trip Tips for Teachers.
4. Slide Set, Muttontown Preserve (35mm Carousel Tray).
5. Film, Muttontown Preserve, (Super mm).
6. Film, Nature's ½ Acre, (16mm - 33 minutes).
* 7. Booklet, Outdoor Education, Activities Just Beyond the Classroom.
8. Bibliography of Films.
9. Bibliography of Books.
10. Glossary of Ecological Terms.

* Examples follow.

FIELD TRIP TIP FOR TEACHERS

So, you're going on a field trip! GOOD, because:

- Field trips provide exciting ways of learning. The natural instincts of students are fully capitalized.
- Field trips provide firsthand observations leading to greater understanding.
- Students thoroughly identify themselves with the learning process.
- Learners participate in real and total situations.
- Positive attitudes are often developed concerning our natural environment.
- Field trips provide a "joy" to learning.
- Field trips provide the opportunity for exploration and further research.

STEP 1 – PREPLANNING

I know you planned this trip thoroughly, but did you:

( )Consider some major purposes or objectives to be accomplished on the trip?

( )Really prepare youself for this trip?
- .. Did you pre-trip the site?
- .. What services are available?
- .. Is there a more suitable site closer to school?
- .. If you are using parents or student guides, what orientation have you provided?

( )Involve your students in the planning of this trip?

NOTE: This is important and often there are many factors to be considered.

( )Consider preparing any curriculum materials (guides or observation sheets) to be used at the site?

( )Really prepare the students?
- .. rules, regulations, manners
- .. clothing
- .. health and safety
- .. materials to bring (keep to a minimum).

( )Requisition the "right" bus and schedule "right" departure and arrival times?

NOTE: This item is most important for successful trip. Plan times carefully, as buses cannot always "wait around."

( )Consider a "rainy-day" alternate plan at the site?

( )Obtain transportation directions just in case the bus driver is lost?

STEP 2 – THE FIELD TRIP

Field trips provide excellent ways of teaching and learning, but remember, fields trips do not do your teaching for you. Your field trip is apt to be more successful if you:

- provide proper leadership throughout the trip;
- divide students into small groups;
- provide opportunity for students to use "activity approach to learning";
- involve students as their "own agent of learning";
- allow students to use sensory experiences;
- don't talk too much, but wait for the "teachable moment";
- provide some "resource person" if necessary.

STEP 3 – POST-TRIP ACTIVITIES

After the field trip, when the experience is still fresh in the students' minds, you can:

- stimulate and motivate for future learnings in all subject areas back in the classroom;
- plan a "future field trip."

Remember, there is no one way to conduct a successful field trip, so . . . **GOOD LUCK!**

JUST BEYOND THE CLASSROOM

OBSERVATIONS OF LIFE IN A GRASSY FIELD

Description:

Students may run and play on a grassy field at school day after day and never become aware of the unique community of living things that are adapted to life in this open, grassy habitat. Exploration and discovery within this familiar area can be a challenging outdoor experience.

Procedure:

Broadly survey the field with your students-asking them to observe everything they can. What do they see? hear? smell? feel? Tell them that there are many wonders right under their feet and that they cannot know unless they explore and observe as scientists do. Let each student choose one part of the field to study in detail. (If the children are able encourage them to take notes and keep records). A good way to begin is to have each student stretch out flat on his stomach and look down into the grass right under his nose. Have them name everything they see (different kinds of grass, bare spots, white stones, ants, clover, a walking beetle, leaf, a dead bee . . .)

If possible let the students study this world among the grass with hand magnifying lenses. Encourage them to find relationships between the plants and the animals.

PHOTOS BY: NORMAN SKLIAR

II. FIELD-TRIP EXPERIENCE AT MUTTONTOWN PRESERVE

A. Field-Trip Session by BOCES Naturalist

Each session with Naturalist will be approximately two hours. The session will be under the direct supervision of the Naturalist and Classroom Teacher. Emphasis will be on:

1. Small Group Approach
2. Multidisciplinary Approach
3. Student Involvement – Direct Learning
4. Ecological and Conservationist Approach to the Environment
5. Direct Correlation to School Curriculum
6. Sensory Approach to Environment
7. Provide Opportunities for Future Exploration, Research and Study

B. Environmental and Outdoor Education Programs at Muttontown Preserve

(Choose one per session) - session - to 4 hrs.

NOTE: All programs will emphasize direct student involvement.

1. COMMUNITIES IN NATURE which emphasizes the ecological relationships of living and non-living things to their particular environment.
2. SOIL AS AN ENVIRONMENTAL FACTOR which illustrates the origin, composition, texture and limitations upon the ecological community. Soil analysis and contrast studies will be made.
3. FOREST ECOLOGY will investigate the composition of a forest community using the quadrate method.
4. ANIMALS OF POND, FIELD AND FOREST which seeks to observe animals and/or signs of animal life in differing habitats. Unique environmental adaptation will be stressed.
5. THE POND AS AN ECOLOGICAL COMMUNITY will stress the study of a small eco-system. Collection and study of micro and macroscopic life will be made.
6. FIELD SUCCESSION will emphasize the orderly process of community changes from abandoned field to climax forest. Detailed studies will be made on lichens, moss, herbacous plants and insects.
7. SEASONAL EFFECT AT MUTTONTOWN PRESERVE will illustrate the cycles of life – plant and animal adaption to approaching seasons – hibernation and migration studies.
8. EARLY MORNING BIRD WALK – this special program will be opened to junior and senior high school classes, ecology clubs, biology classes, etc. Students would have to supply their own binoculars.
9. WINTER WALK AT MUTTONTOWN PRESERVE emphasizes plant and animal survival, animal tracking, temperature studies, snow and ice formations. (Students may be provided with snow shoes for this experience.)
10. NATURE CLOSE-UP will allow each student to observe the natural world about him through a hand lens and microscope. A "new world" of leaves, flowers, seeds, roots, soil, feathers, mushrooms, lichens, moss, insects, etc. will be viewed in relation

to the total habitat. Students will be provided with lens and microscope. (Recommended for elementary grades.)

11. MULTI-DISCIPLINARY PROGRAMS IN THE OUT-OF-DOORS – individual programs may be planned involving art, music, creative writing and nature poetry, social studies, mapping and surveying.

IMPORTANT: It is strongly recommended that teachers avail themselves of the Muttontown Preserve Experience for more than one field-trip experience, thereby providing the opportunity for additional observations and study of the same or new programs or a contrast study due to seasonal change.

III. POST TRIP TEACHER ACTIVITIES

If a picture is worth a thousand words, then a direct experience must be worth a thousand pictures.

The most important person in Outdoor Education is still the classroom teacher who is well versed in the nature of learning and the activity of teaching. The creative and well organized teacher will have many worthwhile activities and plans to be carried out 'back in the classroom'. The field-trip experience at Muttontown Preserve may have served as a MOTIVATION, or as an ON-GOING ACTIVITY, or as a CULMINATION to the course of study. Because of the above and due to a variety of grade levels and interests, it is difficult to offer advice as to the specific direction which should be taken by the teacher and student at this time. However, the value of the Field-Trip Experience would be ineffectual if there were no follow-up activity.

NOTE: The Naturalist will offer ideas prior to this time.

A FINAL NOTE:

The student's first impressions at Muttontown's Pond, Field or Forest would be in the nature of an appraisal or perhaps an esthetic perception. A single observation to an area could be considered only as a preliminary study.

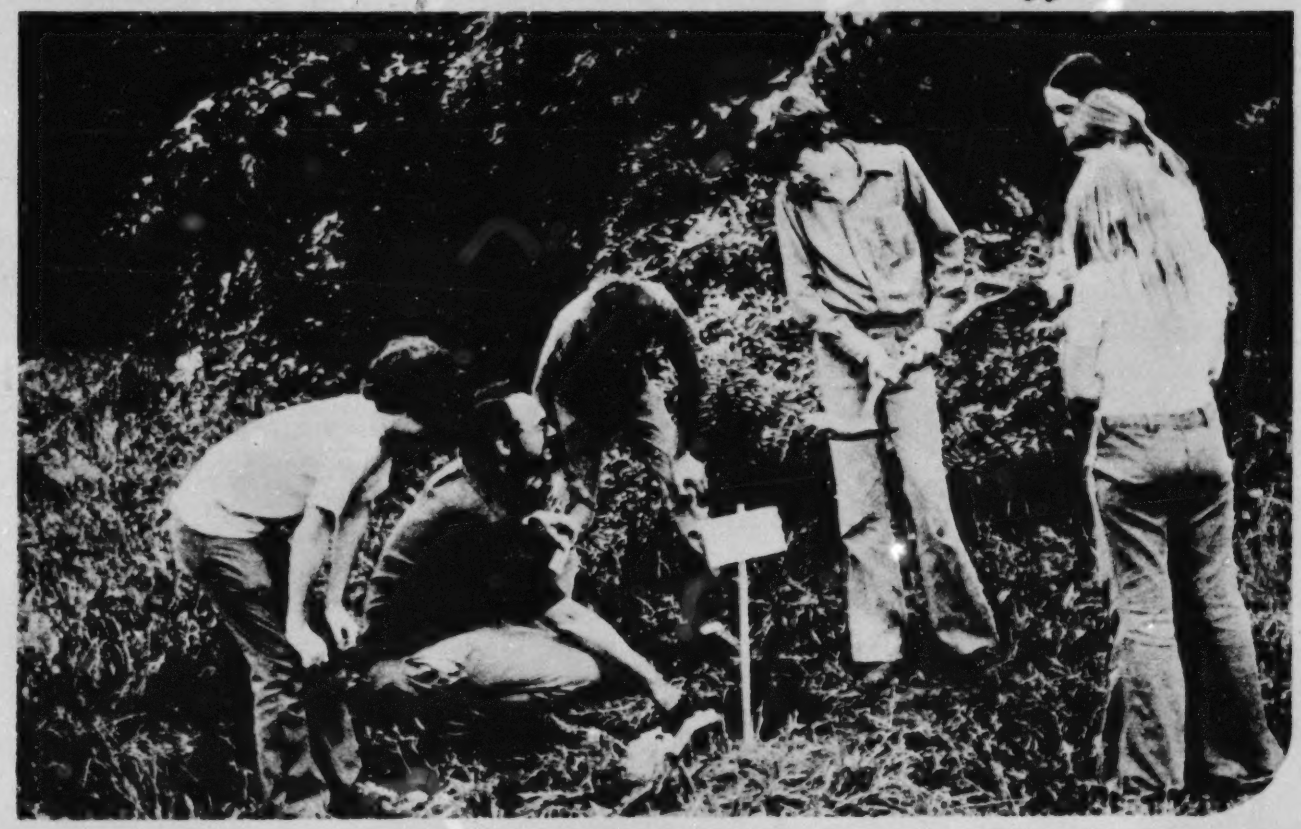
In order to become "ecologically aware" students must return for repeated observations and experiences. We must also be aware that the study of ecology does not present a static picture, but rather the unfolding of dramatic sequences continually occuring throughout the season. These future impressions can now be associated with the intellect. It is now that the total picture begins to emerge, and finally, through appropriate school experiences an enriched view of the total environment will be conceived, imparting a feeling of gratification and a sense of wonder and delight to the world around us.

A CHILD IS BORN WITH A WONDERFUL CAPACITY FOR LEARNING – DON'T LET HIM LOSE IT ON THE WAY TO SCHOOL!

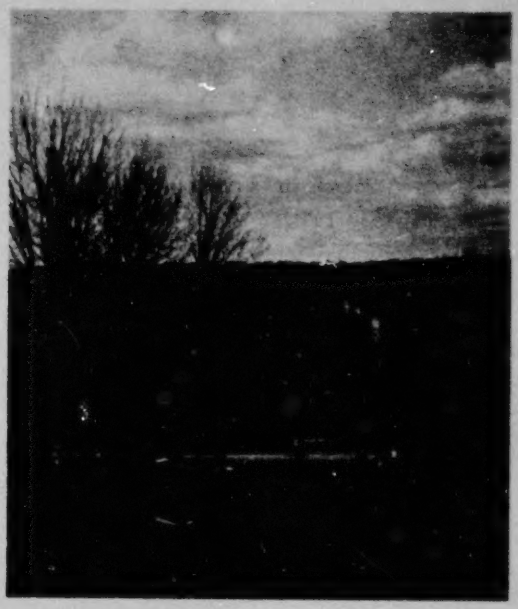
Closing Statement:

Since this program was initiated this fall, more than 2000 students from all grade levels have had a "Muttontown Experience". Twenty-two Naturalists were hired on a part-time basis.

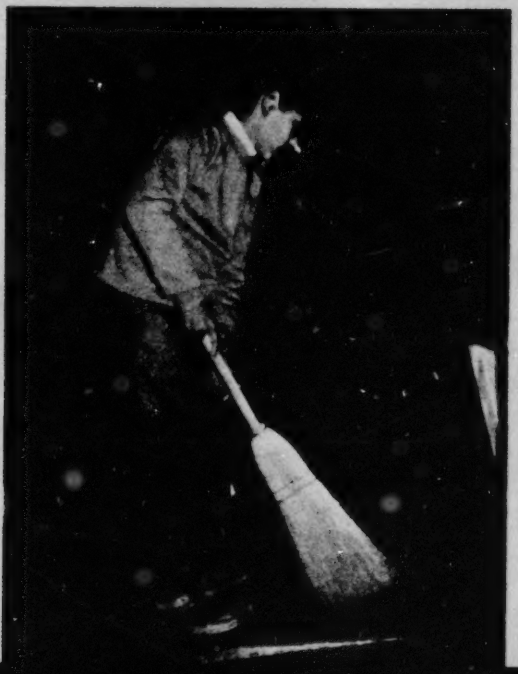
Why not design a DAY camping – FIELD Trip Program of your own, – . . . in your area!



THE OUTDOORS AS A LEARNING CENTER



By: Anne E. Watson
Sixth Grade Teacher
Great Neck, N. Y.



For a number of sixth and seventh graders in Great Neck during the spring and fall seasons the scene shifts from the confinement of the conventional classroom to the wooded expanse of the Outdoor Education Campus of the State University of New Paltz at Ashokan, New York. There, with the sky above, the good earth below, and encircled by natural loveliness, the out-of-doors becomes a true "learning center".

Suburban children, surrounded by well-manicured lawns and carefully-tended garden plots, are privileged with more spacious living than the urban child. But they are woefully unknowledgeable of the natural world about them. A majority have had camp experiences but few have had the unique advantage of learning about their environment under the guidance of well-trained specialists. They may give casual care to numerous household pets but know little of the habits and habitat of common wild animals. It is this gap in the educative process of Great Neck pupils that the Ashokan experience attempts to close. Armed with insecticides, proper clothing for the season, boots and rain gear, pupils numbering 60 or 70 climb aboard the buses for the 100 mile trip on a Monday morning, to return on the following Friday afternoon.

Lest the pupils get the mistaken notion that this is just another "camping trip", classroom teachers who accompany them have laid the groundwork for this venture. Every effort is made to assure both parents and children that this is merely an extension of instructional learning beyond the four walls of a school. Direct experience in learning through the senses will introduce the child to new concepts, as well as reinforce those to which he has been exposed in book learning. Teachers meet with parent groups to acquaint them with the total program. Pupils are given an awareness of the living arrangements and some knowledge of camp layout through slides and discussions. Films about plants and animals are shown to arouse interest and curiosity. Some groups keep day-to-day diaries and design appropriate booklets and clip-boards. Those course offerings which seem suitable to the group are selected and the staff at Ashokan so informed. The more mundane, but essential tasks of collecting monies, necessary forms, assignments of dining-seating and work groups are the responsibility of the classroom teacher.

The Ashokan trip should not be discounted as a "frill". The resultant learnings are varied and vital and enduring.

Under the guidance of a competent staff, children become conscious of the relationship of living organisms to the total environment. They are invoked to what Rachel Carson calls "a sense of wonder." Through observation, discovery and inquiry, "ecology" becomes more than a matter of semantics. The word takes on new meaning. A child begins to see his interdependence with nature and becomes attuned to his world. Hopefully, he realizes everything around him has purpose, and all nature fits into a plan.

In contrast with a world where humans increasingly view human life as cheap and expendable, life is respected at Ashokan. Every "producer" is left to grow and beautify. Every "reducer" is left to complete its task. Pupils soon learn that no one destroys, misuses, or litters the beauty of the landscape.

The adaptability of the children to new living arrangements is heartening to see. So constantly protected against the elements at home, here they become accepting of them. Rain, they discover, does not cause them to disappear. Cold does not make their blood congeal. Accustomed to cars and buses, they soon realize they can walk and, in fact, find pleasure in climbing the hills and exploring the wooded paths. They become appreciative of the nocturnal sounds as opposed to the din of traffic and the cacophony of their own, and the neighbor's stereo. Mothers who vow their children will probably not eat "the food" because they are "finicky" eaters have nothing to fear. Fresh air, exercise and absence of the usual between-meal snacks, encourage the appetite for nourishing well-prepared tasty meals. There are protesting cries when told there is no television available to them at Ashokan. "A whole week without television!" But from the first hour when the fascinating routine begins, "Dark Shadows" and "Edge of Night" and other compelling serials are soon forgotten.

Another feature which should be noted is the involvement of the group. The pupils share in setting, serving, and clearing the dining tables. They feed the farm animals in the morning and evening. They make their own bunks and take turns cleaning the bunkhouse. They learn to get along together. There is responsibility to the group, yet there is time to be alone if one so wishes. Time to investigate little stones and pebbles on the shore line. Time to feel the lichen and moss on a decaying log. Time to explore further the mysteries of pond life. Time to listen to bird songs and animal sounds.

The program, too, provides an examination of, and appreciation for, the past. On field trips pupils are shown glacial markings and geological deposits. The heritage left by man is given consideration in the many folk arts and craft teachings. Tinsmithing, printing, chandlery are made available so that each child may dip into the past and try his hand at pioneer skills.

In assessing the values of this experience for children, one should not forget the exposure to the very dedicated young people who comprise the staff. They are idealistic in their viewpoint, yet practical in their approach to ecological problems. They are friendly with youngsters, yet self-respecting in their dealings with them. They are extremely competent in their teaching, yet patient and accepting of their queries. In short, they so awaken a future generation to the full use and appreciation of their natural world that these children return to Suburbia mentally, physically and spiritually refreshed.

"A Symphony"

OUTDOOR EDUCATION FOR A FIFTH GRADE

By: Jean Druffner
Woodstock, N. Y.

It was like going to a symphony! All 26 pieces tuned up before the debut. Eyes were sharpened; ears were finely adjusted; noses were keenly alerted; and minds were aquiver, searching with expectations.

The score was "Slide Mountain". The arrangement was by the Fifth Grade of the Phoenicia Elementary School. It was an illustrious arrangement involving selections for mathematicians, historians, geologists, meteorologists, botanists, zoologists, scatologists, ecologists, poets, artists, photographers, geographers.

The yellow bus chugged to the trailhead and dispelled at the mountain's south face a merry group of fifth graders and company.

With the sun's rays dancing through the trees, and sparkles glancing off the flowing stream, the instruments were readied for a live engagement.

Compass bearers noted the sun's direction. Temperatures were recorded for the morning air at the bottom, for the water in the flowing stream, and for the spring water at the trough.

Ingenuity enabled the trail to be marked so that following groups would find the way at their own pace (which also was measured as the ascent sharpened). A topographical map rolled out the lay of the land, distances, elevations and type of terrain.

The sections consisted of five students and one or more adults. The mood of this symphony was in five parts, relevant to the pace set among the group members. And the mountain resounded its treasures according to the spirit of the treasure-hunter.

Some sought a quick appeggio pace. A view from the top to these were granted. The sweep of the Hudson River Valley; an idea of the wilderness that once was; a view of the lure that drew men to utilize these natural resources, and a slight realization that time is timeless from a mountaintop.

Some found, in true staccato fashion, another treasure at their feet – a Lilliputian world, or to thec. students, it more likely seemed a "Hobbit" world –. Everywhere one looked, something more would be discovered . . . entrances to burrows underground or into rock ledges; the stretch of very tall trees; the depth of ridges in bark; the age-old accumulation of soil as rich as a dragon's lair of hoarded treasure.

Becoming entranced with the present, as in a quiet legato, some lay in the sun's warmth and heard the solo that the mountain had in this symphony. A solo, for if movement were not held, it would not be heard. The trees, woodpeckers, hawks, chickadees, chipmunks engaged in their art and were acknowledged.

Eyes regarded shapes of trees – twisted and bent, dwarfed, or bannered, acquiring shape and distinction from living and responding to an intense environment.

A pause, – there on the mountain top, embedded in a ledge, was the memorial to John Burroughs. Who is he? The world of this naturalist will become an overture for a future engagement. Through him, an insight to this Hudson River area and this world, will gain a new dimension.

Full orchestration reverberated an harmonious finale: living is learning – blending new understandings and awarenesses with the experiences of a lifetime.

Wisdom older than the seers,
Beauty much too deep for tears,
And holy silence burst the ears.
Ssh, the music of the spheres.
from On The Loose

The experience of the Slide Mountain hike is but one day in the school year. During some of the other days, concepts of social studies, mathematics, science, reading, language arts, leisure education, health, etc. have been developed through various activities.

Some of the simple realizations which have been attained on the playground area are:

–That lichen does not turn into moss; but it is usually around before moss is;

– that rocks are not forever – they too return to the earth;
– that dead trees are living terrariums;
– that a "now-and.then" stream leaves a definite trail;
– that bones can get mossy;
– that it takes nature x number of days to dispose of a dead bird when left in tall grass by the "now-and-then" stream;
– that old snow holds its own community of living things, such as spring tails;
– that ground temperatures, log temperatures, mud temperatures, and burrow temperatures are different, look different in the cold and hot world, and are used differently by those who know best the ways of the ground, logs, mud and burrows;
– that time is of a different duration for the acorn, the salamander, the frog, the porcupine, the mayfly;
– that there is a positive response in nature to grow, to change, to respond to the environment;
– that a hollowed out log and an oak masher make fine corn meal for Johnny cakes;
– that exploration yields its own rewards;
– that skills, applied, yield enjoyment;
– that some people have said a lot and should be read or listened to;
– and that we, too, have a lot to say and will be listened to once we have observed and understood.

Time too often becomes a rationed commodity. The steady routine of daily work, the quiet repose of study, the disciplined attribute of applied effort are so often thought of in segmented time periods and in segmented curriculum guides. We watch a tree live through three seasons; we explore; we feel the wind on our faces, the sun at our backs, the quiet of nature's sounds, the disciplined effort of living things to grow.

Perhaps it can be called idealistic. Yet, somehow, because we have witnessed and participated in nature's art of living, we seem better prepared to assimilate man's revelations and to absorb the information available to us, to acquire knowledge, and to grow in wisdom.

To teach this way is to forsake the security of written goals and teaching guides. It is to respond to an inquiry, to face an unknown, to guide a student in learning skills and developing attitudes. It is to stimulate, to initiate, to respond, to direct, to encourage, to demand that the participant is as active in the learning process as the teacher.

Many demands are made to assure educational standards. These must be met: reading skills, mathematical concepts and skills, understanding of social studies, scientific investigations, spelling ability, penmanship, sentence usage, etc. A conscious effort to live a learning situation makes the logic and reasoning of clear thinking intrinsic to the disciplined effort.

Students, who have experienced moments of life intensely, seem to want to understand and to want to know. Well, we're on our way... there are still weeks to climb more mountains; to read some more of Robert Frost and John Burroughs; to make a sun dial; to map the school grounds; to see the trees bloom; to follow some tracks; to analyze some scat or find some more bones; to write our own poems; to sing some songs; to record our own data; to dissect a fresh roadkill; to watch some eggs hatch; or to transplant our tree saplings now sprouting in milk cartons! Perhaps, in the Spring, we'll also discover that school ends; but now learning has become our own thing!

Photos by: Norman Skiar

AN ADIRONDACK ADVENTURE

By: Thomas Lattimer
Bruce Coulter
and
Al Misener
Setauket, N.Y.

PHOTO BY BURT LAUBER

The initial shock one experiences when he enters Nature's realm cannot be expressed in the wording or language of men. Boundless beauty and unknown tranquillity await those fortunate enough to see and experience the wonders which await us in the woodlands of America. Raquette Lake may be but one of the many places that provide men with a haven from the pressures of daily living in a swiftly changing, technological society, yet it is one of such exquisite beauty that it will never be forgotten by those of us who were privileged and honored to visit it.

The brief descriptive piece above is the way a ninth grader expressed awakening to Nature as we all come to know her as we mature and become sensitive to her inherent beauties. A teacher of English might criticize such writing as excessively ornate and, in terms of convention, his assessment would be accurate. But it's precisely in this very excess that the reader senses even more deeply than the student's words themselves express the sincerity of the student's feeling to what he has been awakened to. And so we have, in a not-so-funny way, a case of poetic license, where convention must give way to the honesty and exuberance of this ninth grader's feeling. And aptly so, for while he has not utilized rhyme or consciously formulated meter, his expression is poetic and his subject, indeed, that of poetry.

Perhaps the reader will notice in our commentary about the student's writing an enthusiasm similar to the student's. If so, this is precisely our intent, for we are very enthusiastic about the outdoor education program our junior high school science department has been running in conjunction with Cortland's Environmental Center at Raquette Lake, New York. For the past five years we have been sending at various times during the school year groups of eighth and ninth graders to this scenic retreat in the Adirondack Mountains. The Raquette Lake experience does not represent a week away from school for our students, but rather an extension of the formal educational process they are involved in for nine months of the year.

As the students arrive at Antlers, the mainland facility of the Environmental Center, and look over sparkling Raquette Lake, they gain their first impression of the beauty that will enthrall them for their five day stay, each day of which centers around a specific activity.

For instance, on the environmental trip, students go out to the field and learn about the natural world first-hand. Hopefully,

this will evoke in all of them an appreciation of nature's beauties and add an additional dimension to the way they perceive and value the things and forces around them. We would also hope that they will come away with the attitude that they, as individuals, can and must accept individual responsibility for maintaining such settings as Raquette Lake.

In addition to the Gelinas faculty members who accompany the student groups to Raquette Lake, the students are guided by two fine gentlemen: Mr. George Fuge and Mr. Jay Cummings, respectively the Cortland faculty's director and assistant director to be sure the Adirondacks come alive to our students under the tutelage of these two men.

The Raquette Lake experience was slowly and carefully concerned with specific student oriented objectives in mind. These included:

1. Recognize and name various flora and fauna found around Camp Huntington. Students will apply their skills on a biological scavenger hunt.
2. Test qualitatively and quantitatively differences in water composition at Raquette Lake and Stony Brook, New York.
3. Read a topographic map of Raquette Lake area and recognize various locations and positions of physical features as seen from the top of West Mountain.
4. Do porosity and permeability tests on the soil around Camp Huntington.
5. Apply water flow studies such as a meandering stream learned in the classroom to the Marion River.
6. Make meterological and air pollution study comparisons between Raquette Lake and Long Island.
7. Develop camping and canoeing skills.
8. Write a log of notes, both social and scientific, that are part of the trip experience.

To these ends, the students' five day stay has been designed as follows:

The first afternoon at Camp Huntington the students were welcomed by Mr. Fuge and oriented to camp life. The students receive fire fighting training and learn escape routes from their living quarters. For all the meals, different groups of students will share responsibilities of serving, cleaning and setting the tables.

The first full day's activity is devoted to canoemanship training and a short trip to Golden and Silver Beach for a solving of the geological problem on beach environment. Here, the students learn to apply the principles of sedimentation, leaching and ground water flow learned in the classroom to the actual sediment situation encountered.

In the afternoon, Mr. Fuge takes the students on a nature trip that makes the Adirondacks come alive with stories of the past. In the evenings students will work in small groups and participate in a biological scavenger hunt.

PHOTOS BY BURT LAUBER

(Above) Learning to test water samples before going afloat.

(Below) Not everying went according to plan.

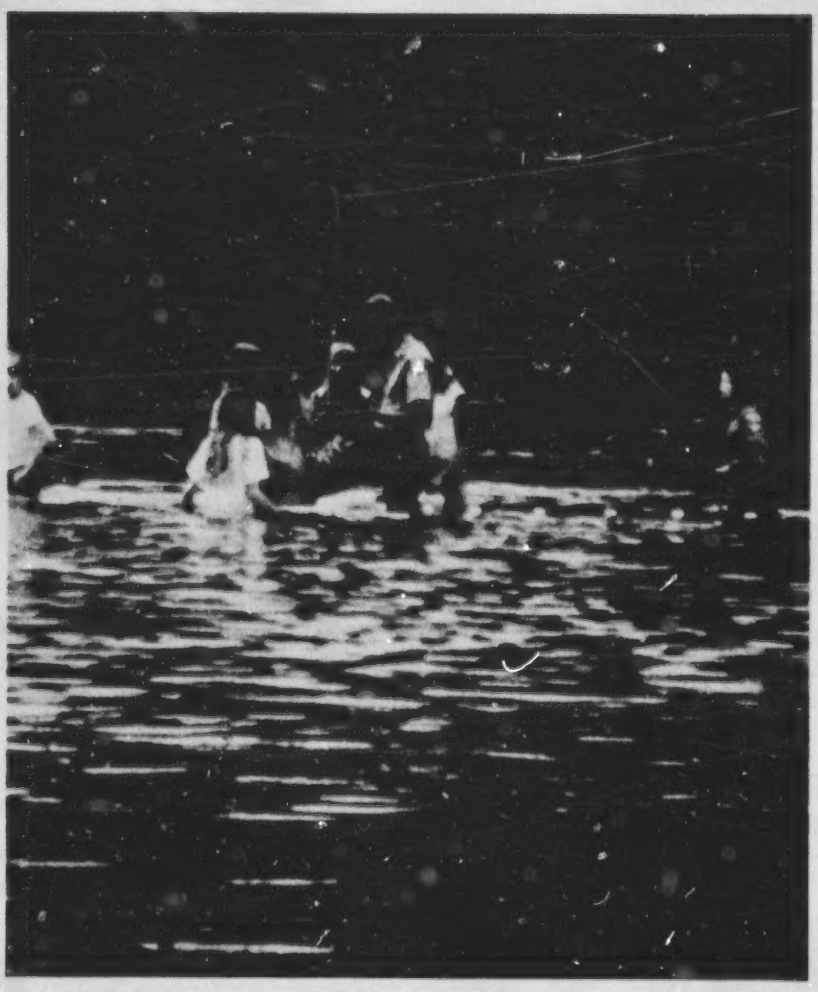
PHOTOS BY DOUG PEKS

The second full day is usually devoted to a mountain climb up West Mountain. Bedrock studies, map, and compass studies are done by the students at the top of the mountain. Students develop an awareness of what magnificent natural resources we still have in this country and some of the ways we might begin to conserve them.

The third full day is devoted to a canoe trip up the Marion River. During this trip, stream flow studies and water analysis are done on meanders.

The last morning is spent gathering the gear and sadly saying goodbye to the place and people that have meant so much to us during our stay. Although the students and teachers all come from the same school and a strong feeling of knowing one another, the knowing only takes place in the confines of the classroom. The students have friends in school who are much like themselves having the same classes and interests. At Raquette Lake an entirely new environment unfolds to these students. New friends are made with people they never communicated with before. Students sometimes assume leadership roles that they never would be in if we stayed at school. in some, hidden personalities appear. Students see other students differently, teachers see certain students differently and teachers see their fellow teachers differently – everybody benefits from this experience.

"I have done things I never even imagined myself doing, things I was afraid of, but have little fear of now. I think I have more reasons for wanting to save what I see around me. My life has been definitely changed, I say this without one doubt in my mind." (Former Gelinas Student)



Streams and Rivers

AN ECOLOGICAL CLASSROOM

Article by: William Moth
Illustrations by: Michael Storey

Photo By: Michael Storey

Treading softly on the cool forest floor, a distant sound causes you to hesitate, then draws you near. As you move closer, the air becomes cooler and the sounds run the bass scale with gurgling, bubbling notes.

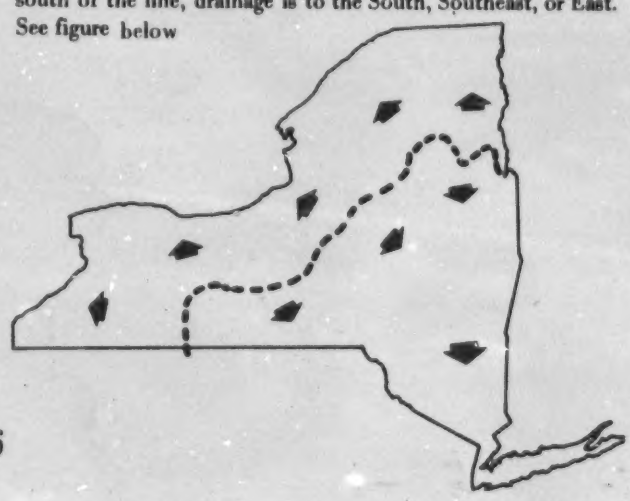
The sounds are those of water gargling from the earth's throat to a small surface pool. You hesitate again, kneeling on the soft green peripheral mat, to look more closely at the gently waving fine green filaments and the shadow of a water strider, gliding across the surface, as it leaps over pebbles and plumets into the crevices between.

The water that drew you to this place has gone. Slipping through cracks in the pool's stone dam, it runs down the hillside, first slowly, then faster and faster, and you are drawn again – to its rushing sounds downstream. Water in all its forms has molded life and land in our world. Its effects have been felt for billions of years. The study of running water is but one small segment of the world of water.

Ice Sculpture

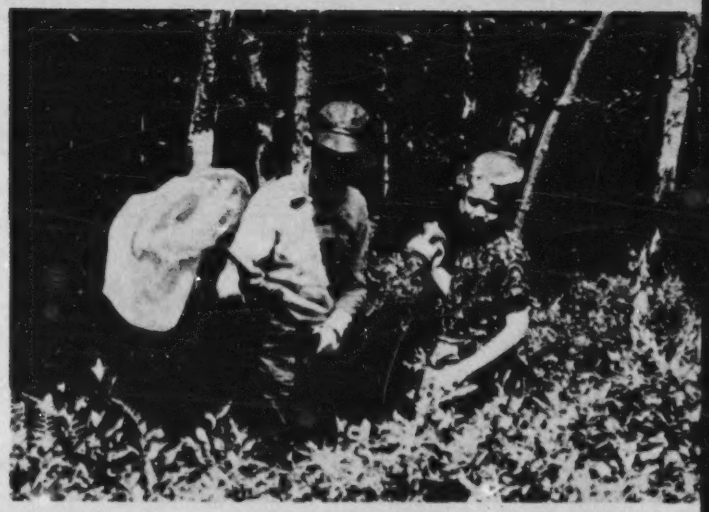
From the Hudson Bay region, and the peaks of the Adirondacks, tons of ice, miles high, converged on New York. This ice, during its 4 penetrations, was to carve the face of New York and lay the foundations for many of the streams, lakes and valleys present today.

Because of the glacial deposits and scourings of New York's face, the drainage pattern for the state's streams is divided nearly in half by a line from the southeast corner of Steuben County to the Northwest corner of Essex County. North of the line, drainage is to the North, Northwest, or West; to the south of the line, drainage is to the South, Southeast, or East. See figure below



FROST VALLEY Y M C A ENVIRONMENTAL EDUCATION CENTER

By: Mr. William Devlin
Resident Director



From the moment old Camp Wawayanda moved from Andover, New Jersey to its newly acquired home in the Catskills in 1957, it was evident that this was to be much more than a summer camp.

The 2200 acre estate of Julius Forstmann, founder of the well-known Forstmann Woolen Industry, included many buildings which were ready to use. The Forstmann Conference Center immediately began to serve mid-winter conference groups of fifty people.

The camp was originally owned and operated by the Board of Trustees of the YMCAs of the State of New Jersey; but a new corporation, The Frost Valley YMCA, has since emerged and expanded to serve YMCAs, churches, schools, and youth groups throughout the northeastern United States.

In 1969, the facilities were first made available to schools for their Environmental Education Program. In 1972, about 2500 persons will enjoy a Resident Environmental Education experience at Frost Valley.

Instead of a "packaged program," Frost Valley offers its fully winterized facilities for the school to use with its own program. Full-time, resident maintenance and food-service teams take care of the operation of the Center's facilities. The Resident Director works with the school's program coordinator, who is totally responsible for the program. Two or more Frost Valley staff assist as guides on hikes, drivers for hay rides; and, on occasion, other program areas.

The Dining Hall is one of our most popular activity areas (three times a day, plus evening snack) and you are promised all you want to eat.

The most popular program areas are probably the streams, ponds, and non-flowering plants. Astronomy is great on clear nights because the surrounding mountains cut out every trace of light from the horizon. Large undulating field areas are ideal for field mathematics or surveying. Contour maps of the property, to aid in compass work, are available for distribution to every student.

A dozen old foundations wait to be dug and explored while we pull together bits and pieces of the history of Frost Valley for our handbook. You can hike nature areas or climb mountains. There are deer to watch, birds to listen to, chipmunks to talk with, porcupines to laugh at, and skunks to back away from. There is much worth recording with sketch pad or camera.

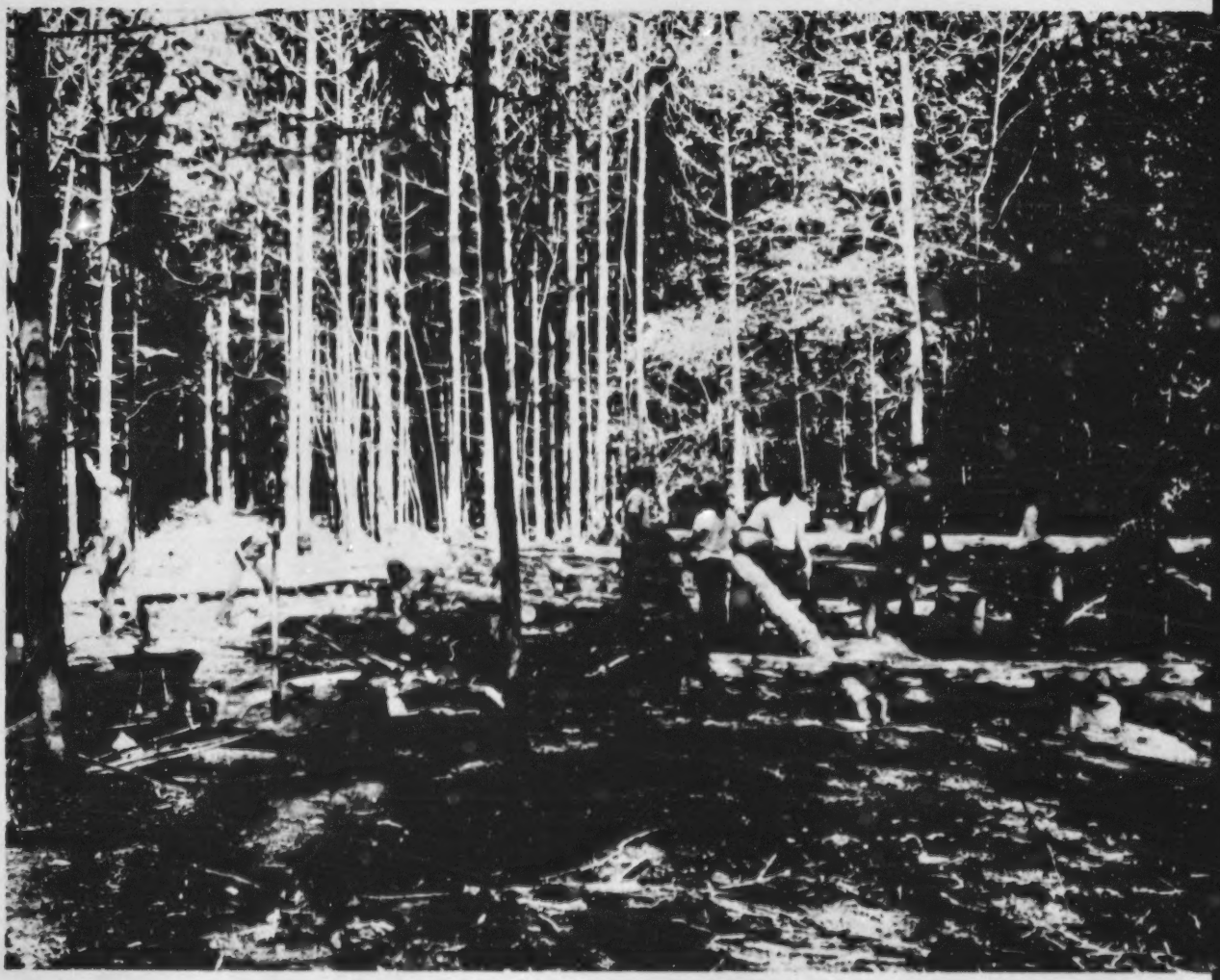
With winterized accommodations for 250 people and a spring and fall capacity of more than 500, great care is being taken to make the most effective use of the facility without wearing it out. This we hope to accomplish by avoiding over scheduling in areas of "easy program" or "ready access." It is not only unnecessary, but impossible for every child to see everything, so we work toward the dispersing of study groups to as many widely separated program areas as possible.

Small groups are best for program purposes, and they are also best for the land. Although trails are being developed in some areas, we are anxious to prevent their creation in most areas. One hundred children walking together in line through a previously unmarked woodland area cannot help but make a trail, which can rather easily be followed even after several weeks. One teacher per six or eight is the ideal ratio and fifteen is probably the maximum number that a teacher can work with effectively.

We like the word activity group rather than class, because it helps to leave the idea of four walls and a classroom back at the school. With a group of six or eight, it should almost never be necessary to get in line, and whistles should be reserved for emergency use. Handing out lunches to eight kids on a hike requires no organization. That fifteen to thirty-minute period, sitting in the woods, could prove to be the time that develops the proper attitude and atmosphere for the rest of the week.

Maybe we can avoid the terms "student" and "teacher" at Frost Valley. This is more than a school. We are all now people in a community developing a twenty-four-hour-a-day awareness and concern, and a feeling of personal responsibility for one another and for things we formerly took for granted. This is an experience of personal exposure of people to the earth upon which we are so totally dependent.

More than buildings and roads, or a place to eat, sleep, play, or study for a week; Frost Valley is woods and streams, mountains and ferns, dark nights with countless stars, quietness, inspiration, poetry, and a place to learn to appreciate being alive and to want not to desecrate this world, our home.



HOMESTEADER'S SCHOOL

By: Gary Golding

John Dorr Nature Laboratory

Photos by: Willy Berliner

Years ago, when settlers were *given* 160 acres of land and the promise of ownership, the hardships of homestead living drove them to the cities. In an ironic shift, today's city-suburgan life is driving many of our good citizens back to the country.

These people are rediscovering the immense value of living close to the land – making their own goods, growing their own foods, building their own homes. They are learning that to a large degree, they can regain the pleasures of independence and self-sufficiency.

We at the John Dorr Nature Lab have started a school for people who want to join in this move back to Nature, but who are short on the basic hand skills and practical knowledge that would make this sort of move a realistic one. The Homesteaders' School is our effort to prepare people so they can manage to stay on the land once they make the initial investment and get there.

As was once the rule, our morning and noon-dinner meals are our big meals, and supper is just a hold-me-over until the next day's breakfast. In this way we are getting the most nutrition immediately before we go out and work. Also the dinner meal provides a chance for everyone to get together and relax after a full morning's work at various locations on the farm.

Daily chores are also a regular part of homestead living. Here, they are our only requirement and exist on a rotating basis for everyone.

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At the Homesteaders' School, we strongly believe that our program is comprehensive enough to insure any modern homesteader a good start on his own place. The program covers five major areas: Livestock, Construction, Gardening, Homestead Skills, and Modern Homestead Economics.

LIVESTOCK

We offer quite a variety of livestock in the hope that, should they even decide to raise animals in the future, students will know which ones suit them best.

Daily livestock chores rotate so that everyone may learn to care for our horses, cows, goats, oxen, rabbits, hogs, ducks turkeys, chickens, geese, and mule. By next year we will probably have bees and sheep.

Monty Doyle, our visiting blacksmith, shows how to shoe Bucky our Welsh stallion. Girl is Debby Schwarz, a student who came in June and is still with us taking care of our horses.

Besides daily care we try to cover feeds and feeding, breeds and breeding, dairy products, shoeing, animal shelters, and basic veterinary skills.

When our meat animals mature, we learn how to butcher and prepare the meat, and then how to tan the hides (pelts).

CONSTRUCTION

Construction played the largest part in our 1972 program. We build three frame structures, remodeled an old barn, and constructed a log cabin and log sugar house. From pouring the foundations to shingling the roofs, these operations were manned by students and volunteers at every stage.

Alternative living shelters are also encouraged. Presently, we have three tipis and we hope to build some yurts next summer.

GARDENING

Every student in planting season has the opportunity to plant an individual garden, and maintain it throughout the course. In the following course, however, another student will pick up where the former left off, right through to harvest time. This group effort will be shared at a Thanksgiving banquet when everyone will be invited back for a dinner they helped put on the table.

We will, of course, cover all aspects of gardening no matter what month a student comes, but in all fairness, a person most

A good crew gets a log in place for the maple syrup cabin.

Modern log raising.

interested in gardening can learn more by coming during the May – June months, when we are most active in the gardens. We cover soil testing and composting, and we work up from hand tools to machinery in caring for our crops.

Our experience lies in gardening for food, which traditionally has not included the new organic and biodynamic methods. We are, however, willing to experiment in these areas and will do some of our own studying on it this winter.

HOMESTEAD SKILLS

The kitchen is the focal point of most of the homesteader's labors, for it is for the table that his garden is planted and his animals raised. Ellen works with every student in the preparation of all of our meals, and there couldn't be a better teacher. She will also help in baking the bread we eat fresh every day.

When meals are over, the kitchen can still busy itself, as butter needs to be churned, vegetables need canning or freezing, and berries can soon become jam.

Outdoors, there are other essential homestead skills. They include: fence building, land and forest management, land clearing, forge work, care of tools, and maple sugaring.

HOMESTEAD ECONOMICS

Living entirely off one's own land is almost a fantasy these days. If you don't believe that, you'll have to ask the thousands of small farmers that go broke each year. People who have a *lifetime* of harvests behind them, cannot make it in today's economy in spite of what they have learned over the years.

The homesteader learns that cash is the hardest crop to raise and perhaps the most important. We have added a new area to our program to drive this message home – Homestead Economics.

We plan on having optional discussions which we hope will result in all of us learning the cheapest ways to make a go of it, and yet still maintain a desired lifestyle.

Some of the topics:

1. The cash crop
2. How to buy land
3. Where to buy land
4. How to buy livestock
5. Recycling everything
6. Developing resources for material
7. Taxes
8. Building codes and zoning
9. Building permits
10. How to *use* technology
11. Who can you ask?

We are not experts on these subjects, but we have a lot of ideas, are doing a lot of research and studying, and will invite people in to cover the areas we are least familiar with.

Along these same lines we will visit a nearby homestead, where our friends Jack and Frog are doing better than most. They have been through two winters now.

A popular chore for both students and goats

The old-fashioned method

There was no waiting line for this activity,

but everyone enjoyed the milk and cream.

Matt Garrison (son) taught himself and then students how to use broad axe to hew logs.

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Homesteading is a life you carve in your own style, and that in itself is a major attraction. It would, therefore, be a bit presumptuous for us to boast that we can "teach" you how to homestead. What we can do is help the modern homesteader learn the many skills that are invaluable to country living. These may include anything from how to build a log cabin to how to prepare the noon dinner meal – from vegetables we have grown and canned, meat we have butchered, bread we have baked.

We are confident that we can teach these things because of who we are. Bill Garrison, our director, was born and raised on an Indiana farm, and is raising his own family in the same mold, here in Connecticut. A family farmer and outdoorsman all his life, Bill knows that the only way to pass on the skills he has learned over the years is by working with students in the field – individually, if possible.

While Bill is in the field planting or harvesting, Ellen is in the kitchen helping students prepare that which has been grown. She covers all aspects of food preparation and preservation. Without question, we eat well.

Also on the staff are an experienced carpenter and a mason who work side by side with a corps of volunteer workers.

When we feel that we cannot adequately cover an area, we invite competent people from the outside community. Last summer, Monty Doyle, our blacksmith, gave us lessons in shoeing and forge work in all of our courses. Jeff Nye, our County Agent, discussed forest and pasture management. Bob Anderson showed us how to wire one of the frame buildings we constructed.

In the future, we will augment this group by inviting real estate and tax people, local veterinarians, and just about anyone who will give us a broader scope to our approach to homesteading.

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The Homesteaders' School, located in the soft, green hills of western Connecticut, is one year in existence. Our courses are one month in length, running from May through October, and we are trying to limit enrollment to a reasonably small number. Tuition is $400, which covers everything but medical expenses, should there be the need; scholarships are available.

When staying at the Homestead School we will utilize our homestead site (an area we cleared and began building last summer/fall) for daily living, meals, and meetings. This area is isolated from the rest of the 200+ acre John Dorr Nature Lab facility, so as to insure us an atmosphere conducive to a family feeling and individual attention. The building itself, like many New England barns, is made of hand-hewn timbers and rough-cut lumber.

The atmosphere we hope to create here is one of early rural life. Accordingly, we rise with the sun and work a full day. We milk and feed the livestock first thing, and then we eat a good breakfast ourselves.

Jobs for all. These girls are pealing red pine logs with draw knives.

Fresh strawberries for shortcake and preserves

* * * * * * * * * * *

It is our experience that there is, amidst all these things to learn, just one thing that will distinguish whether you are ready to homestead – and that is whether you are willing to work. That might sound trite but most people who come here really cannot (or will not) work in a way that will keep them in food once they are on their own.

It is for this reason that doing is our method and work is our key, in helping to prepare future homesteaders. There is a lot to learn but it is all meaningless if your hands cannot translate that knowledge into something more tangible, like a fence or a house.

Some people spend a lot of money to come here and leave disillusioned at just how much work it does take to make a successful move to the country. They never get there, and all we can say in response is that we've probably saved them a lot of money in the long run.

For those who do choose to join in this current move back to the land, our experience is yours to tap. If you heed only half of the errors we have made (and learned from) over the years, then you are ahead of the game, and coming is worth the money. We will have saved you money in your future also.

From good hard work comes the basic values and pleasures of homestead living. We cannot emphasize that enough. But when the work is done, it is time to relax and have fun, and we believe as strongly in that side of country living.

When the sun is going down, people here might pick up a book or fishing pole and pursue the well-earned pleasures of the homestead. Or perhaps that means a stroll or a visit with friends, though sometimes we all get into the school bus and go to the ice cream shop. On Saturday nights we try to plan square dances and our Sundays are free (except for livestock).

As far as we know, the homestead school is the only one of its kind, and fills a sorely felt gap in rural education. We would prefer to see these skills passed on within families – as they once were – but our alternative in modern times is to at least keep these skills alive. Better than that though, we are confident that with our staff, program, and country perspective, we can really be beneficial to the conscientious homesteader of today.

ROCK ECOLOGY

Text and Photo by:
Thomas A. Stock
Smithtown, N.Y.

There is something about big rocks that appeals to me. Perhaps it's the simplicity of their lifeless interior or the fact that they defy me to move them.

Recently I decided to build a rock garden, and I began keeping my eyes open for suitable size rocks. Soon, a sizable pile accumulated in the front yard but I still had several staked out that I couln't budge by myself. As time passed, I noticed that one of my big rocks that I had been keeping an eye on was gone. Someone beat me to it. I wondered at his strength and vowed to observe the remaining rocks before they were over powered too.

By photographing the rock where I found it and taking an inventory of what was under the rock, around it, and on it, I came up with some interesting points that lead me to accumulate some boulders and put them in an enclosed courtyard in the high school where I teach and let time and nature take its course.

The crust lichens cling to rocks with an unbelievable tenacity. On some rocks, I've found that when they are moved, the lichens die. Lichens therefore must be more delicate than we think. I know they have trouble living in polluted air. Tombstones are a favorite spot for some species. Marble tombstones are more favorable than slate. Why? A lichen on a rock can be a valuable teaching tool if it can be kept alive and protected from excessive touching. Here is the beginning of soil production.

The quartzite rocks are interesting. I've never seen a lichen growing on a quartzite. Probably because of quartzite's hardness and low mineral content lichens don't bother trying to establish a community. Most of the time lichens choose sedimentary or igneous rocks to begin succession.

Underneath quartzite however, a few animals make their homes. White worms and ants find comfort. Sow bugs and centipedes, earthworms and a few beetles interrelate in some manner.

Rocks change their colors dramatically when rain falls on them. This rain-rock interface is the area in which sodium and chlorine ions are released to begin their journey to the ocean where they can establish themselves as a statistic known as salinity.

Temperature studies reveal variations both above and below, sunny and shady side, if done on a hot enough day in midafternoon. Students are always amazed at a 10 degree difference beneath the rock. Humidity beneath the rock is more difficult to obtain but if you have a humidistat (cost $35.) you can obtain an instant reading. Incidentally, this is an important tool for the teacher who wants his students to obtain fairly accurate quantitative data on microclimates associated with rocks.

If the rock is weathered granite, soil testing will reveal a slightly higher Ph near the rock compared to further away. However, fairly accurate equipment is necessary. Phydroin soil test paper seems to work. The same is true of the dark basic rocks like gabbro, basalt and diorite. However, make sure a good degree of weathering has taken place and do the tests first to see if you will see observable results.

Insects love to bask on rocks in the hot sun. Oftentimes at night I've found insects resting on rocks to gain the heat that they retain a few hours after the soil has given it up.

I've spoken of rock ecology from only one point of view thus far. In addition, every rock has a story built into it as to how it was formed or in other words, the environment that existed at the time is being formed. If you decide to build an ecology rock garden, choose a variety that will accomplish this purpose as well. As intrusion can help you ask the kids which part is older. A conglomerate can be used to compare the nearness of the ancient shoreline to a sandstone or shale. A fine grained granite can be compared to a coarse grained pegmatite to infer cooling rate. Pock marks in quartz pebbles can be used to infer differential weathering.

If these boulders are randomly placed in some safe area of the schoolyard, they can be used for several purposes - art (the light on smooth rocks reveals the beauty and texture) biology, and geology. English teachers may want to use the rock area as a setting for the theme of a compositon, poem, etc.

If you decide to start picking up rocks - the bigger, the better, make sure you can handle them first as they can cause muscle strain and back problems. Renting a block and tackle and using some old lumber to pull the rock into the trunk of your car on which you've placed some old pieces of carpet, will insure your safety.

Happy Rock Collecting!

Teaching Tips

The Homestead Hike: Teaching Social Studies Outdoors

By: CHARLES H. YAPLE
Cortland B. O. C. E. S.

One of the basic definitions of outdoor education describes it as"...teaching those things out-of-doors that are best taught there." Operating from this philosophy children are taught math, science, English, social studies, ecology and other lessons while in residence at the Camp Owahta Outdoor Education Area near Cortland, New York.

A social studies lesson concerning life on a pioneer homestead is taught outdoors at Camp Owahta. The lesson begins with a short film dealing with daily life on a homestead in the early 1800's. After the film the children, in small groups, head for the woods. Before entering the forest the children are told, "We're going to play a game while we hike to see which of you is the best detective. Please list on a piece of paper any item that gives evidence that man has been here. The person with the most different items will be the winner. Your lists will be checked at the end of the hike."

The homestead hike then, begins as the group enters the forest and approaches a thick stand of large maple trees. The instructor discusses with the group tree clearing methods used by our forefathers and emphasizes the strength needed to cut large trees with a broadhead axe.

Photo by Charles H. Yaple

Sixth grade students at camp Owahta, studying pioneer clearing methods.

Further up the trail, the group plunges into a thick stand of beech and cherry. The instructor declares that this once was a corn or oat field. Without fail, the children respond with laughter as they see nothing but entangled trees and leaves. The instructor then points to a very large pile of field stones that the pioneers picked by hand while clearing the land to plant crops. Thus, the students can appreciate the efforts put forth by their ancestors to provide food for themselves.

On up the trail an old stone-wall fence is encountered. Here, an opportunity to discuss folklore arises. A short story dealing with pioneer feuds over broken fences and wandering cows is read. Often poetry such as Frost's "Mending Walls" is also related.

The next stop is an old garbage dump. The instructor just happens to have some old bottles in his pack. Shortly, a mini-history lesson evolves concerning patent medicines, such as Healy and Bigelow's Kickapoo Indian Oil, and other store products that the homesteaders purchased in town. Searching for bottles in the dump never fails to gain the students interest and enthusiasm and provides them with real insights as to beliefs and practices of their forefathers.

The group progresses on and soon discovers the homesteaders' home sites. While searching the old stone foundation, students invariably find pieces of artifacts such as hand-made nails, scythe blades. axe heads and other hardware, Each of these discoveries leads to discussion and understandings concerning homestead living.

The old stone-walled well, located near the cellar hole, provides a good method of developing student appreciation as to the physical labor expended in those early days. The instructor explains with illustrations how the homesteader had to dig a gigantic hole, often 20 to 30 feet in circumference and deep enough to strike water. And then, they had to lay up the stone well housing and back fill around the housing. All this was done by hand with pick and shovel!

The hike ends with a tabulation of lists that the students have kept showing man's presence. Usually, the winning list has 60 to 70 items and without fail, 85% of the items are trash. An Ecology lesson indeed!

Thus the homestead hike has incorporated social studies with history, writing, poetry, reading, and ecology. The students have also employed their powers of observation by playing the "evidence" game. All this and they have been involved both physically and mentally in a direct learning experience. As one author suggests, "If a picture is worth a thousand words, then it can be construed that a direct learning experience is worth a thousand pictures."

That's outdoor education!

FIELD TRIPS ARE TO OUTDOOR EDUCATION

AS CAMERAS ARE TO THE PHOTOGRAPHER

FIELD TRIPS CAN

- **provide firsthand observations**
- **provide direct experience**
- **provide greater understanding**
- **provide a "joy" to learning**

by: Norman Skliar
photos: L. L. Baumgartner

Beaver dams are fun to explore and interesting to examine.

A beaver colony offers many subjects in natural history, social behavior and population explosion.

Carefully examining a decaying log can be exciting. Poke through the soft wood and discover how many varieties of animals live here.

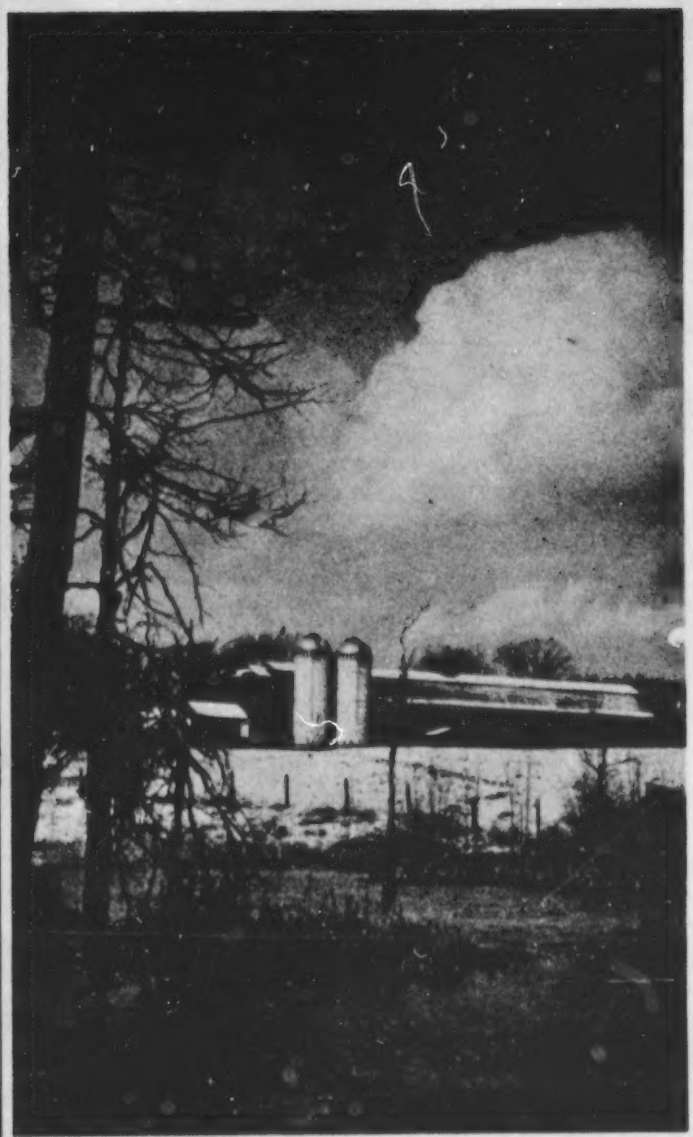
Finding a completed ecological succession from moss and lichens to a beech tree is an interesting find!

But, finding a HAWK'S NEST is a HIGHLIGHT of a FIELD TRIP!!

THE SPRING POND

AN
ECOLOGICAL
CLASSROOM

TEXT and PHOTOS By:
RICHARD B. FISHER
Cornell University



In these years of environmental crisis, years during which we have seen the reduction and spoilation of so many natural features, it is heartening to note that one of the outdoor educators most valued teaching resources — ponds — are more plentiful now than they were a century ago. The abundance of ponds in New York and neighboring states is, of course, the result of landowners recognition that ponds are important sources of livestock water, water for fire protection, and water for outdoor recreation. Outdoor educators have long known that ponds offer unparalled opportunities to teach basic biological and ecological concepts. Spring is an ideal time to take your students to this ecological classroom in the outdoors.

Prepare the Class

Successful field trips are the result of careful planning. Accordingly, you and your class should know why you are going to visit a pond and what you hope to learn from your investigations there. Everyone should understand that this is not going to be a casual outing! Presumably you have been discussing plants and animals and the places where they live; therefore, your visit to the pond will be a logical outgrowth of your in-school studies.

How to dress will be an important consideration. Low boots, galoshes, or ordinary rubbers will be sufficient depending on the nature of the shoreline. No one need wear hip boots, since it is not advisable to wade in the water because that would make the pond muddy and decrease the visibility. After school clothing would be preferable to the attire normally worn in school just in case someone does have an accident. Some of the students might wish to take cameras for a pictorial record of the trip; for this, the Polaroid "Swinger" is ideal because the photographer knows his results so quickly.

It is usually best for the teacher to take the collecting equipment. In my experience, this consists of inexpensive soup strainers, pint or quart jars with lids, several enamel refrigerator trays, and several gallon jars. These are all packed in wooden boxes which, when empty, provide ideal "tables" for setting up equipment at the study site.

At the Pond

What you and your class do at the pond will be determined by the amount of time available. Ideally, you will want to spend two to three hours there. Alternatively, you can make quick studies of the gross ecology, collect what specimens time allows, and do the rest of your investigations back in the classroom. On arriving at the pond, you ought to take some time for a general inspection of the habitat. What kind of pond have you visited? Is it a farm pond, a woodland pond, or a

vernal pond which will dry up in several months? Can you detect aquatic plants in the water? What shoreline vegetation is there? Can you and the class identify any of the plants present and indicate their importance to this ecological community? If your visit to the pond occurs in mid-or late-April, there ought to be an abundance of animal activity. Peepers and other kinds of frogs will be calling, birds such as the red-winged blackbird will be singing from territorial song perches while tree swallows, perhaps, will fly overhead. Tracks of raccoons, muskrats, or deer along the shoreline tell of mammals that visit the pond when humans are not present.

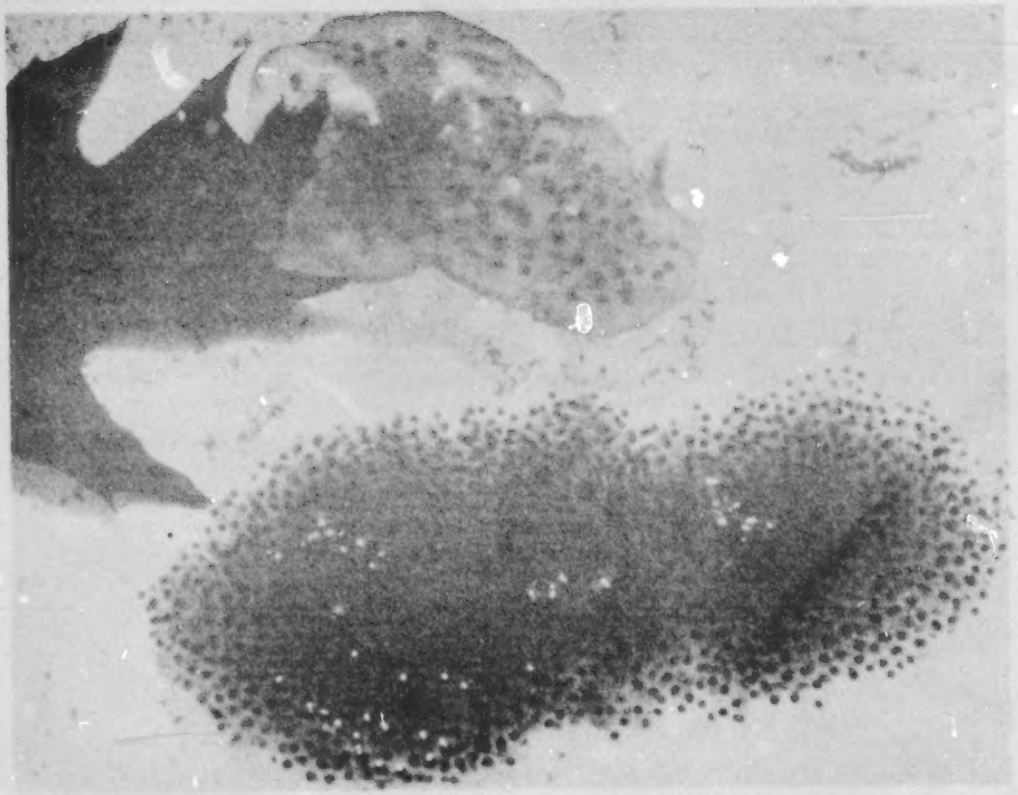
Unquestionably the most exciting part of your field trip will come when the class makes its own biological survey of the pond inhabitants. If sufficient equipment is available, give each student a jar and strainer. In order to reach out from the shoreline without wading, give some students strainers which you have previsouly tied to broom handles. As your students stand on the shoreline and look into the water, they will not see very much. Here is a good time to point out that a pond resembles a forest; namely, in either habitat we see little evidence of life until we make a close examination. Show the students how to pass the strainer through the shoreline vegetation and then, by turning the strainer upside down and tapping it on the open mouth of the jar, to transfer the captured organisms to a jar half-full of pond water. In ten or fifteen minutes of collecting around the shoreline, the class will have captured a representative sample of the plants and animals living there.

When the day is pleasant and time is available, I like to examine our catch right there in the field. Using the upturned equipment boxes for tables, I invite the students to empty their jars into the refrigerator trays. Then we gather around our ponds-in-miniature to learn the names of the plants and animals and gain an introduction to their interrelationships. (There will be many questions here, but it is best not to provide answers which students can learn for themselves by later observation or by consulting the books in your library.) If time does not permit, ask the students to pour the contents of their jars into the gallon jars you have brought along for the purpose and take everything back to school with you. Glass gallon jars are preferable to plastic ones because of their transparency; however, plastic jars are, of course, much safer and less subject to breakage en route back to school.

In your Classroom

Whether or not you made an initial study of the plants and animals at the pond site, you will still want to take a

These Cornell students demonstrate the methods and materials for pond study are simple.



Salamander egg mass (top) contain comparatively fewer eggs than those of frogs, and they are characteristically attached to a leaf, stick or other plant material.

representative collection back to the classroom for further investigations and experiments. For this, take plenty of pond water with you so you will not have to add any chlorinated tapwater. If you do not have enough tanks in which to set up four or five aquaria, you can use glass gallon jars. The quantity and kinds of observations now open to you are almost without number. In the space we have here, I can list only a few.

1. What animals eat plant material? And what species of plants do they eat?

2. What animals eat other animals? How do the predators capture their prey? And how do they eat it?

3. How do the aquatic animals get the oxygen they need? Observe how the water scorpion uses its snorkle, how the backswimmer carries a silvery film between the bases of its legs, how the diving beetle regularly comes to the surface to change the air under its wing covers.

4. Do some of the pond dwellers seem to get oxygen directly out of the water? Here you will want to perform the classic demonstration in which you place a dragonfly nymph in water in a jar lid. Then you allow a drop of fountain pen ink to fall very carefully into the water behind the animal. As the dragonfly nymph takes water into its anal gills, watch how the ink is drawn in and then expelled. The mayfly nymph also takes oxygen out of the water, but it's gills are arranged on the sides of its abdomen. Place a nymph in a pop bottle cap with a little water in it and have the students use a hand lens to see the beating of its external gills as the nymph creates currents of water around itself.

5. Take a few duckweed leaves, count them, and place them in a separate jar of water. At the same time each day, examine these few leaves and note any changes in size or number. After only a week's observations the class will be surprised to see how much reproduction (all of it asexual) has taken place.

6. If your catch included a caddis fly larva in its case, remove the animal from its case, provide it with litter from the pond bottom or even grass cuttings, and watch how it makes a new case.

7. If you wish to study the development of a dragonfly nymph, place one in a jar by itself and feed it pieces of earthworms on the end of a pair of forceps. The nymph will soon become conditioned to feeding and will grow steadily. Place a pencil-sized twig in the jar so the nymph can climb out on it when it is ready to transform into the adult. The emergence of an adult dragonfly is always an event that no student can ever forget.

8. The most important plants in a pond community are those we cannot see with the naked eye! So, have the students study drops of pond water under their microscopes; they should find a host of algal species (as well as minute aquatic animals). You may wish to place some of these in a

water cell and, with a microprojector, flash the whole mininature community on a screen for everyone to see.

9. The spotted newt is one of the most widely distributed salamanders in North America and New Yorkers are fortunate in having an abundance of them. And when it comes to studying amphibian courtship it's pretty hard to beat the spotted newt as an example. How does one tell the male from the female? Although superficially alike, you will notice that the male newt's hind legs are two or three times larger and thicker than its front legs. The female, by contrast, has hind legs barely larger than her front legs. In addition, note that the tail fin on the male newt is much higher than that of the female. Put your two animals in a tank of their own along with a few sprigs of waterweed or other living aquatic vegetation. As the water temperature rises in your classroom, the courting urge will manifest itself and someone will discover that the male newt has wrapped his hind legs around the neck of the female. If your students observe the courtship and egg-laying of newts, they will never have to read about it in a book nor will they ever forget this feature of amphibian biology.

10. Did you find amphibian eggs in the pond? If so, place some of them in a refrigerator tray of water in a cool shaded place in the classroom, and cover it with a sheet of Seran wrap to reduce evaporation. Your students will be thrilled to watch the development of these eggs. In time, they will see the embroyos thrashing around inside their gelantinous membranes. When the larvae break out of the egg mass and swim around in the water, count their legs. Salamander larve are four-legged at birth, while frogs and toads have two legs. If your larvae are salamanders, in New York State they will most likely be those of the spotted or the Jefferson's.

These are but a few suggestions. Student observation of the mininature ponds in your classroom aquaria will suggest many more.

Follow-up Discussion

As a result of your studies at the pond, classroom observations and investigations, plus library research, your class will have come face to face with some of our most basic ecological concepts. Here are just a few of the ideas you are now ready to discuss:

- the concept of an ecological community
- food chains and food webs
- interdependence and interactions
- adaptations for survival
- each community has distinctive characteristics
- a community is important to creatures that do not reside in it
- the phenomenon of succession
- to understand the inner workings of a community requires much study
- a community can perpetuate itself and maintain its integrity for long periods of time provided man does not interfere.

Tools to Help You

Some of the teaching tools I find indispensible for this subject are:

1. The Swamp in Spring. This is a high quality, Droll Yankees recording in which you "accompany" a biologist and his friend. The title is misleading, for this is a fine way to introduce the trip. Available from: The Droll Yankees, Providence, Rhode Island, 02965.

2. Voices of the Night. Incomparable recordings of the voices of 34 frogs and toads. Tops for identification. Order from: The Laboratory of Ornithology, Cornell University, Ithaca, New York, 14850.

3. Amos, William H., The Life of the Pond, McGraw-Hill, N.Y., 1967. 232 pages. Exciting prose, easily understood text, plus numerous color and black and white illustrations make this the best choice for anyone who wishes to learn about pond organisms and their ecology.

Streams and History

Algonquins, the first New York inhabitants, settled the eastern and coastal areas. Somewhere around the 13th or 14th centuries, the 5 Iroquoian groups began the settlement of the western portions of New York, and any other areas the Algonquins were unable to hold. The streams of New York were important in providing the Indians navigable waterways in nearly any direction they needed.

Ironically though, the Indians located village sites away from major rivers. For although the river offered transportation, it also presented the danger of village access by the enemy in times of war.

Europeans, on the other hand were tied to the old country lifestyle of trade, and founded their major towns directly on the river systems of New York.

The key to Iroquois power was their control over the waterways of New York. This control over the waterways west has also been the reason for present day New York State's economy, and trade control. New York State is the key to the west. Stream and river influence on New York history will provide an interesting topic for social studies classes. This might also be incorporated into a report on man's uses and misuses of a particular stream.

Convenience to Burden

To the Europeans, New York's streams became more than a source of food, water, and transportation. They became sources of energy to turn millstones, and a drainpipe to carry away wastes – first human, then technological.

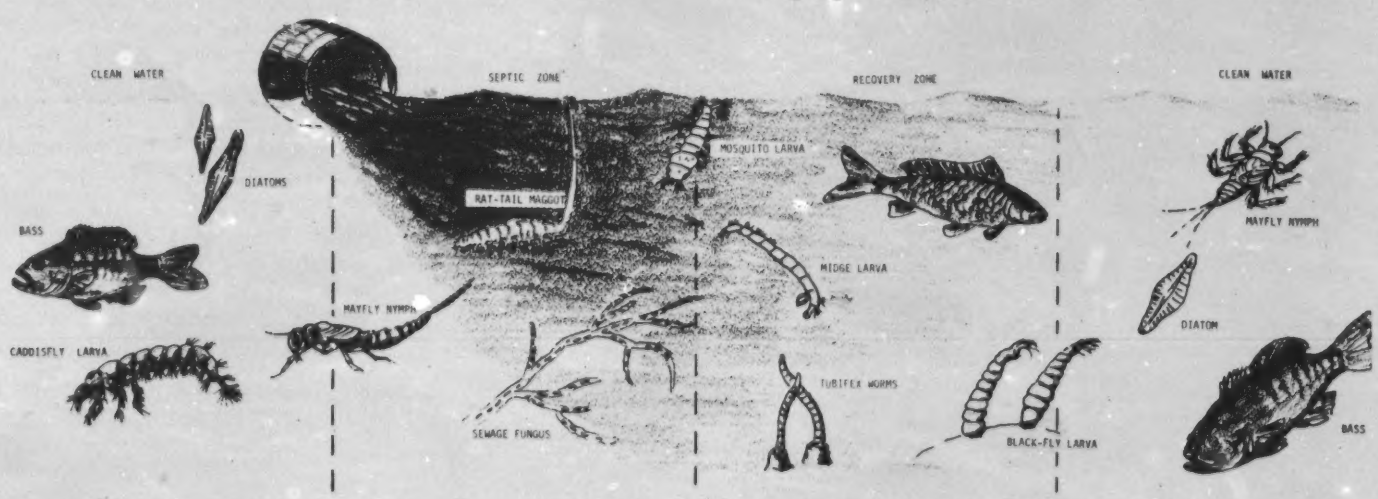
The Hudson River provides an excellent example, starting at its highest permanent source – Lake Tear of the Clouds, a 2 acre Adirondack Pond – and following it over its 315 mile course, the river changes from a white water brook to an unconfined sewer in New York Bay. A similar instance is found on a smaller scale with the infamous Nine-mile Creek. Its upper reaches between Otisco Lake and Camillus, in Onondaga County, supports extensive populations of mayflies, caddis flies and trout. Its lower reaches, prior to emptying into Onondaga Lake, are barely fit for carp and rattail maggots.

A bus trip along a particular stream is one way of analyzing change. Either natural change from the source to the mouth or man-induced changes make interesting investigations. Using the latter, stops should be correlated with towns, farms, and housing developments. Prior to any stream investigation, the class should find the stream, its landscape, and watershed on a topographic map.

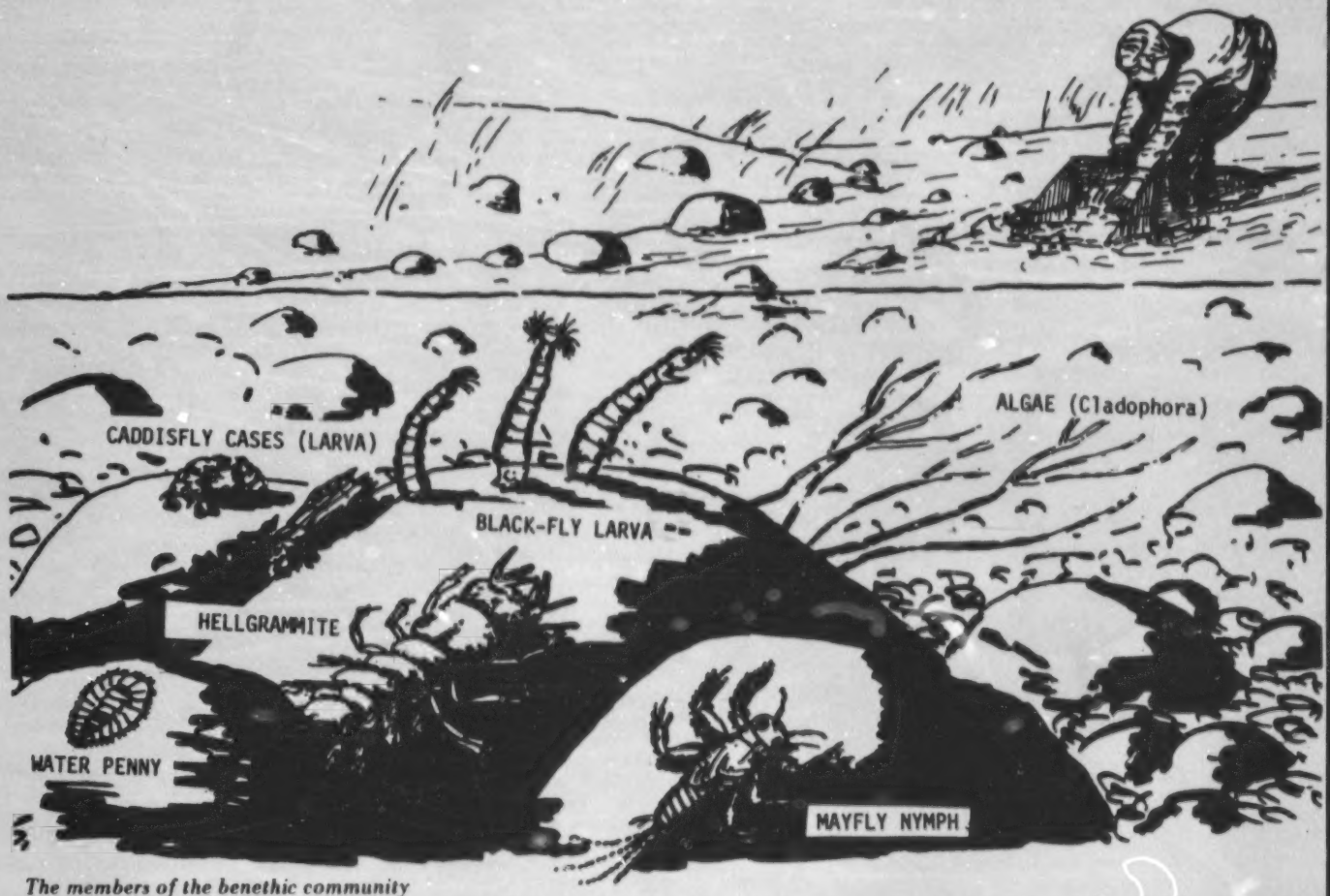
The Seasonal Stream

Spring marks a time of rejuvenation for the stream as well as many other communities. The meltwaters add appreciably to the stream's volume and current. Much debris from the surrounding lands is added to the stream. Some will be carried along the stream course, and some will accumulate on the stream bottom as a source of food and cover for the stream inhabitants. With the great quantities of debris being carried, and the increased current rolling rocks and boulders, life becomes perilous for large and small alike. Algae attached to rocks can be ground away, as the rocks are tumbled and battered by other rocks. Attachment lost, the algae is at the will of the current. Insect larvae can easily become dislodged from their bottom habitats and carried downstream to an unsuitable environment, or become fish food as they are swirled through the swelling waters. Fish are also in danger, but if they are quick enough to avoid it, there is a bountiful supply of food being carried by the raging currents – including many a fisherman's donation. But, all seems to balance out to a rejuvenation and an assistance to the stream. Sediments are routed from the bottom and replaced by larger rubble, insect and fish populations are tested to find which are most fit, adapted, and inherently wise – in other words – which are most worthy of the stream's bounty and care.

Late spring and early summer are times of bountiful insect life.



Stream pollution has been going on since the days of the first settlers. Today technological wastes present even greater recovery problems.



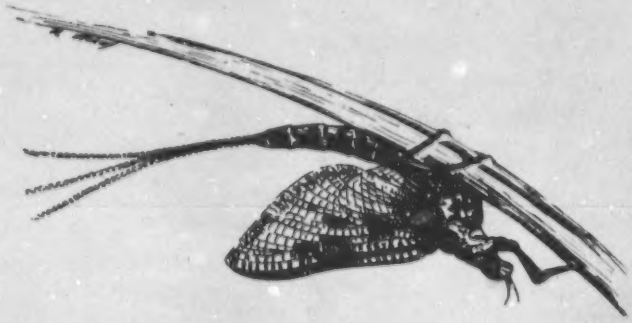
The members of the benethic community provide unique studies in adaptation.

Mayfly nymphs cling to the bottom catching current borne food in their front legs. Other types graze on algae.

Those insects that made it through the winter and spring will attain adulthood, and the distinction of passing their characters on into the species gene pool. The mayfly is one aquatic insect that has fascinated many a mind. From 9 months to 2 years, the larvae's purpose is to feed, grow, and store energy for the adult stage; then one day it gives up its bottom hold for another purpose. It moves to the water's surface; where a molt will leave the sub-adult floating on a larval skin raft while its wings becomes readied for use; flight to a streamside bush brings it to safety. The milky sub-adult now undergoes another molt to a patterned adult. The adult form has no mouth parts, its sole purpose is to mate, lay the eggs, and insure another generation. Those who survive the trials will carry on the species – and some have only 15 minutes.

Summer will initiate continual emergences of insects from the stream. New fish and invertebrate generations will be given their chance. Nature will continue to test by warming the waters, narrowing the living stream bed, and an occasional flash storm.

Fall brings a lift to the water level and a cooling of the stream. Many insects are preparing for the winter ahead either with last emergences and reporductions, or last larval molts prior to



After a second molt, the mature adult mayflies will gather in great swarms to breed along streams.

winter. This is the season of reproduction for the trout. The nest is made over gravel bottoms in riffles, and guarded by the male. Depending on water temperature, the hatch will take between 44 and 90 days.

Winter slows life in the stream. Many of the animals have burrowed into the stream bed for the duration of the cold weather. But there are still active insects and fish for the interested investigator. Occasionally, a great blue heron, hesitant to migrate, may be seen foraging in open streams.

Overall, the best times for stream investigation are the late summer and early fall. Activity is high, and the waters are generally cool and clear enough to see the bottom and the many organisms inhabiting the stream.

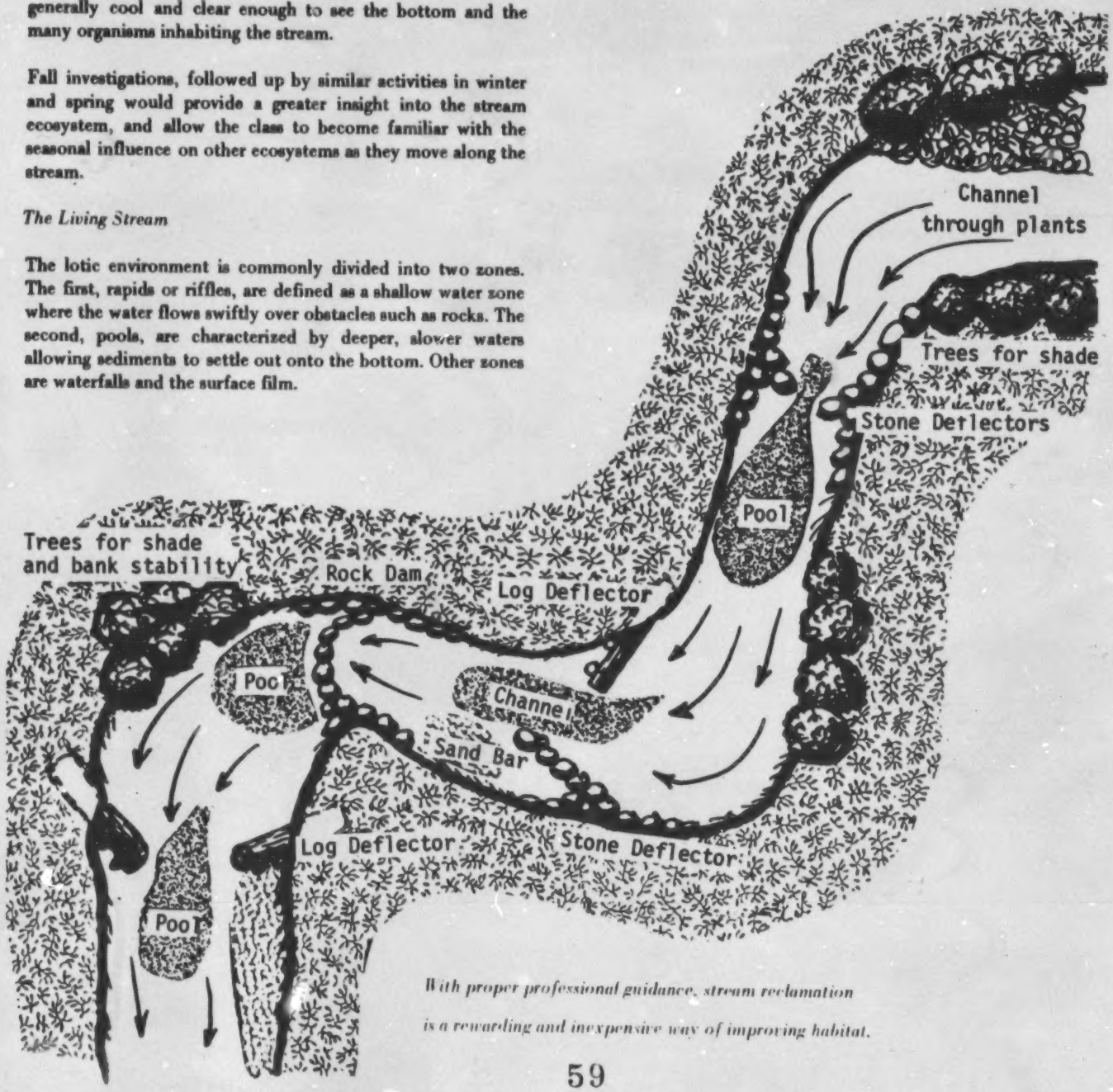
Fall investigations, followed up by similar activities in winter and spring would provide a greater insight into the stream ecosystem, and allow the class to become familiar with the seasonal influence on other ecosystems as they move along the stream.

The Living Stream

The lotic environment is commonly divided into two zones. The first, rapids or riffles, are defined as a shallow water zone where the water flows swiftly over obstacles such as rocks. The second, pools, are characterized by deeper, slower waters allowing sediments to settle out onto the bottom. Other zones are waterfalls and the surface film.

Organisms living in streams, whether in rapids or pools, are adapted to offer the least amount of resistance to the flowing water and to maintain a stationary position against the current. Streamlining, mucous covering, flattening of the body; hooks, suckers, and lifelines are but a few of the many adaptations seen in stream dwelling organisms.

Field trips primarily to investigate the habitats or adaptations of stream dwelling organisms can provide provocative learning situations both in and out of the classroom.



With proper professional guidance, stream reclamation is a rewarding and inexpensive way of improving habitat.

One unique property of the stream is that communities share with each other much more than other communities. By the very nature of streams, i.e., their unidirectional flow pattern; gases, dissolved solids, organic matter, and living organisms caught in the flow will be carried downstream through other communities. Therefore, the quantities of each available for downstream communities depend on upstream use and contribution.

Oxygen for the stream comes from aquatic plants, water/air interface diffusion, and, to an extent, ground water flowing into the stream. All living organisms, plant and animal, compete for the oxygen supply. O_2 becomes exceptionally important in streams because most of its inhabitants are intolerant of low oxygen levels. Streams, having cool waters can dissolve more gas; and the turbulent air/water interface, promotes greater diffusion of oxygen into the water.

Another important contributor to the stream's oxygen supply and the lower levels of the food chain are single celled algae called diatoms.

Stream Investigations

Investigations of aquatic habitats are most effectively accomplished by groups. Each group is responsible for examining and recording one set of data from the habitat. Interchange of group responsibilities affords complete exposure to all data collecting methods.

Physical – this group is responsible for such data as turbidity, current, light penetration, bottom type, width, depth, mapping.

Chemical – collection of data on dissolved oxygen, HCO_3 – CO_3 (bicarbonate – carbonate) levels, pH, total hardness.

Plankton – stream work for this group is minimal, as there is usually little plankton (i.e., organisms that drift with the current; phytoplankton – plants, zooplankton – animal) in streams. Sampling is done with a cone-shaped plankton net made of nylon stocking or cheesecloth. After plankton sampling is done, the group should sample another community – the aufwuchs – which are organisms living permanently or temporarily attached to objects (from old fence posts to plants) projecting above bottom.

Benthos – this group is concerned with bottom dwelling organisms. Collection by hand picking off rocks, or by scraping along bottom with a rake followed by a net or screen of sorts is usually effective. As this group collects, they might also collect from the neuston, or the surface floating organism community.

If the group does not possess proper preservatives, the inventories can be done streamside and correlated back in the classroom.

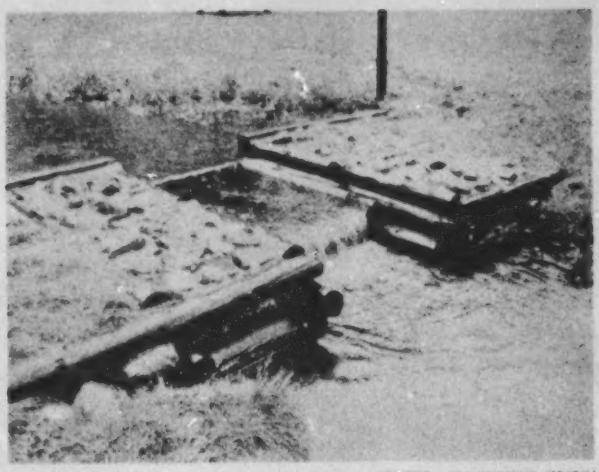


PHOTO BY: MICHAEL KREBILL

Stream Reclamation and Clean-up

Classes or youth groups will find stream reclamation or clean-up activities both rewarding and educational. Both offer immediate visible effects and long range benefit for both people and stream inhabitants.

Roger's Conservation Education Center at Sherburne has a stream demonstrating reclamation. The Department of Environmental Conservation has a similar demonstration each year at the New York State Fair. It would be worthwhile for a group anticipating reclaiming a stream to visit one of these facilities prior to initiating the project. Professional advice from DEC, or the Soil Conservation Service should also be sought out and followed.

The stream is a fascinating one-way street, changing with the seasons and years, an ecosystem unto itself, yet open and dependant upon donations from the shore.

Welcome, to the world of streams and rivers.

Books on Streams and Activities

Laun, H. Charles, The Natural History Guide, 1967, 2nd edition, Alsace Books, Alton, Ill., 62002 – $5.50

Morgan, A. H., Field Book of Ponds and Streams, 1930, Putman Nature Field Book, G. P. Putnam's Sons, N. Y. – $5.00

Needham and Needham, A guide to the Study of Fresh-water Biology, 1962, 5th edition, Holden-Day, Inc., San Francisco – $2.75

Reid, G. K., Pond Life, A Golden Nature Guide, 1967, Golden Press, N. Y. – $1.25

Usinger, Robert L., The Life of the Rivers and Streams, McGraw Hill, N. Y. – $4.95

AN ECOLOGICAL CLASSROOM

THE FOREST ENVIRONMENT

By: John A. Weeks
Director
Rogers Environmental Education Center

"Every farm woodland, in additon to yielding lumber, should provide its owner a liberal education. This crop of wisdom never fails, but it is not always harvested."

Aldo Leopold
"A Sand County Almanac"

In precolonial times eastern North America was characterized by its forests. The nature of the forests varied greatly from north to south. In the latitude of New York State they were mostly deciduous which means they shed their leaves in autumn. These rich woodlands were evidence of centuries of environmental enrichment starting with the sterile droughthy layers of sand and gravel left in the wake of the last glacier, and developing through the interaction of simple plants, weather and minerals into a rich deep substrate capable of supporting a forest. Let's consider the forest first as a history lesson.

The Natural and Cultural History of the Forest

A forest is a living museum. Every tree and shrub, depending on how much of the total history it has witnessed, forms a paragraph, a page or a chapter in the chronical of events. When time or a logger harvests the tree, the record is revealed. Each time a new log is bucked off, it opens a new page of history.

Look at the stump and see what it shows. Count the rings – nearly 200 years of cycling seasons – some good (note the broad rings) some not so good (note the narrow crowded rings). These last few years the rings have been extremely narrow. This plus a spreading circle of butt rot would cause the forester to say, "High time this tree was cut. It's past prime now." The pileated woodpecker, the racoon or the gray squirrel might have a different point-of-view.

Natural history is only part of the story preserved in the now recumbent trunk and branches. Man has left his mark on many pages. A scar, now healed, shows that fire, perhaps a pioneer campfire, damaged the tree when it was only 20 years old. In 1870 when the tree was nearing the century mark, blazes were made to allow for the attachment of a pasture fence. Fencing, staples, and axe marks, long since buried by the expanding growth of the tree, and exposed again by a bit of careful shaving. Apparently the pasturing of the woodlot ceased after 70 years. That was over 30 years ago, but we can still see a gap in the succession of undergrowth due to the browsing of the cows.

The Forest, A Rich Natural Community

A forest is also a living community. For richness and dynamics it has few equals. In many ways it is the ultimate in communities. Think of it – over 100 feet deep, as tall as a ten story building, possessed of nearly as many "floors" from tree tops to roots. Each layer has its own special climate and its own special complex of creatures. All are adapted to the conditions which prevail, and their interdependancy may be deep and exquisite.

Like buildings, woodlots differ. In fact no two are alike.

Some may be totally evergreen, some deciduous, and some of mixed composition. This, in itself, implies vast differences. In our part of the country a walk through the winter woods, knee-deep in snow, provides an entirely different assortment of sights and sounds from those which summer brings. Seasonal change, then, is another characteristic of our northern woods.

Trillium and adders tongue bask in an early spring sun. The ground they occupy will see little direct sunlight after the full emergence of beech and maple leaves. Because their biological timing devices are set for early germination and flowering, these spring flowers may even set seed before the spreading leaves obscure the sunlight.

Winter, with its deep mantle of crystalline water, is a time of extreme drying. Ice and snow formation and frozen ground combine to remove moisture and prevent its replenishment. Leaf fall and the sealing off of the leafscars make it possible for the trees to survive this hibernal drought. Evergreen trees have special moisture saving devices, but they, too, suffer from repeated exposure to "dry northers." Trees on the leeward side of the woodlot will suffer least. The trees to windward help create a windbreak. This is one of the many advantages of community living for trees.

The Forest and Natural Recycling

Underfoot we may see another important aspect of community development. In late fall dry leaves crackle underfoot. By spring, compressed and dampened, they form a sound deadening carpet, ready to be returned through natural breakdown to the soil and air from which they came. Dig into the moist forest floor and reveal all the stages in this decomposition from leaf skeleton to fine black soil. You might have to dig a foot or more to find the rock and gravel which represent the geologic base of the soil. This foot or so of organic material represents the distillation of centuries of energy transfers which have started with green plants capturing and converting sunlight and ended with the decomposition of plant and animal remains.

In this natural cycling is the secret of the perpetuation of the wild community. All life is built from basic raw materials. When life ceases, its elaborate fabrications are physically and chemically torn apart to regenerate the resource base.

The community is not concerned with its species makeup. Only man and individual animals care about the welfare of either individual or species. The natural community is concerned only that there be producers, consumers and decomposers in proper numbers and in proper ratio to maintain life and a stable or a growing resource base. Of course the community does suffer its natural catastrophies. It has setbacks which are caused by too little or too much prosperity within one portion or another. In the main these upheavels are self limiting. The community adjusts accordingly. It restructures itself, and the least adapted or the least adaptable species may disappear, but the inexorable processes of energy conversion and resource base enrichment go on. In the fullness of time the disrupted community may grow to resemble its old self in almost every aspect.

As an upland community the forest may provide the ultimate in outdoor classrooms. It is rich, both in depth and diversity. It is possessed of interesting cycles, both annual and bioenergetic. It is sanitary, and its energy base is growing. Man, in his preoccupation with the welfare of a single species, and his ignorance of energy cycles, finds that these attributes are dwindling in his own community. There is a lesson here that deserves our attention.

The Forest: An Esthetic Cornucopia

History or biology, however, are not the terms in which most people characterize the forest. A trip to the forest is first and foremost an exercise of the senses – all the senses.

Step into the woods in autumn. Fallen leaves, still bearing a portion of warm color, crunch underfoot. Blue jays and crows give strident warning of our presence. The autumn woods has a resonance not present in any other season.

The winter woods is often deadly quiet. This is its characteristic, but all around us etched in the new fallen snow, is the record of many activities. With a little practice we can learn to read this calligraphy. Most of the record seems rather prosaic, but occasionally it has a mystery or drama worthy of Poe or Moliere.

The hues of spring are subtle but satisfying. The spring woods is redolent of growth. Opening buds and decomposing plant remains have their own distinctive aromas. The real characteristic of spring, however, is sound and movement.

Spring is the carnival season. Migrating birds, in their brightest colors, pass through, leaving behind the echos of their vocal preparations for nesting. In spring sound emanates from the forest. Later the emerging leaves will provide a sound containing barrier.

Enter the woods in summer. The foliage creates ceiling and walls, and there is a real sense of entering – of passing from one microcosm to another. The atmosphere is damp, the air is often insect ridden, and yet the principal impression may be of coolness and peace. The incessant calling of the vireo has a mesmerizing effect.

This is really a paradox, for summer is the season of growth and fruitfulness in all communities. These characteristics have no accepted sensual tags, however, and it may take a little exposure to make them evident.

The Ultimate Upland Community: The Ultimate Outdoor Laboratory

In the foregoing paragraphs, an attempt has been made to characterize the forest community in such a way as to suggest its merits as an environmental classroom. You should be able to find in it something appropriate for your curriculum and your base of knowledge. The next move is up to you. If you are going to take advantage of it, you'd better get out there and get acquainted.

Why Visit a Forest

Leopold, in the statement quoted above, points out one of the reasons for visiting a woodlot. It has a never ending "crop of wisdom" to impart. It takes some preparation, however, and on occasion some tools are needed. A first step might be to organize your thoughts about the purpose of the trip. One or more of the following questions might be considered:

1. What is a forest?

   The foregoing article attempts to provide several answers to this question. A forest is a community of living things which is dominated by woody plants. A what-is-it trip might simply attempt to explore its sensual components – sights, sounds, texture, aromas – or might actually catalogue the living and non-living components. Lets not forget the opportunities to measure the nature and extent of the environment itself.

2. What happens in the forest?

   Such dynamics as periodicity, bioenergetic relationships, depth and layering, microclimate, and natural role-playing have been suggested in this article. We might, by direct observation, and by library research, determine what the creatures we have catalogued are actually doing there. Here again are ample opportunities for measurement and experimentation. Let's not forget the importance of what used to happen there, and of what might happen in the future.

3. What does the forest mean to man?

   Maybe you'd prefer to answer the question, "What's this all mean to me?" Again we have hinted at answers in the article. The woods is an esthetic cornucopia. In addition it is an energy storehouse. It produces oxygen. It influences climate. It enriches the resource base. It can be managed for increased production of certain products. Its mismanagement can have widespread deleterious effects on the land.

What Kind of Visit Best Fits My Needs?

Several approaches to the forest field trip may be required, depending on the grade level and curriculum. Here are several:

1. Introductory or Sensitizing Visit

   The idea of just going to the woods for the sake of being there will not appeal to some. It may seem too much like "unteaching." Still, properly planned and directed, this can be the most enriching and motivating of all trips. The use of literature, music, and visual aids in the preparation for the trip is urged. Art, music, and creative activity "on-the-spot" make it adaptable to all age levels.

2. Demonstrative Field Trips

   On-the-spot lectures or demonstrations may involve experts such as foresters, wildlife biologists, woodlot owners, or interpretive naturalists. This is the commonest, but not necessarily the best approach.

3. Investigative

   The true laboratory out-of-doors implies the chance to use knowledge, tools, and skills to gain new understandings. This is most frequently applied in math and science, but also has major implications for history and creative arts. A certain amount of this kind of experience is essential for every student, because it reveals so much about how learning is initiated and validated.

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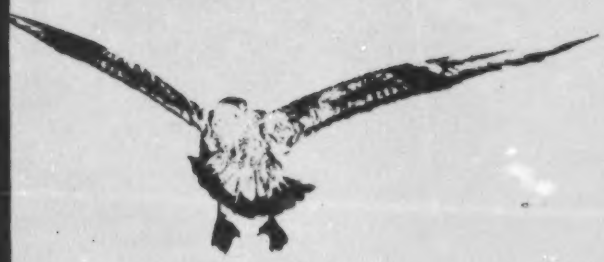

THE SEASHORE ENVIRONMENT

By: NORMAN SKLIAR

AN ECOLOGICAL CLASSROOM

When Louis Agassiz was queried about how he spent his summer, he replied, "I traveled this summer——I got half-way across my backyard." The Great Neck Public Schools, with their proximity to Long Island Sound, have just such a backyard through which their students may travel in the elementary outdoor education program.

ECOLOGICAL APPROACH

Using an ecological approach to the science curriculum, the program emphasizes the study of living things in relation to their environment and each other through a series of field trips to the local seashore. In this marine program, (as well as in the forest, pond, stream and open field ecology program) students learn that all organisms have special means of adaptation, all are interrelated and dependent upon their community and that no organism lives without affecting its environment and in turn, being affected by it. Man, and his many practices are constantly studied along with good conservation education.

ACTIVITY APPROACH TO LEARNING

Before the first field trip is undertaken, the students are thoroughly introduced to the "activity approach to learning". This approach allows for direct experience, enabling each student to become his own agent of learning.

Each Student is provided with a SEASHORE ECOLOGY ACTIVITY BOOKLET. The purposes and directions for these activities are explained through the use of personal slides and Super 8mm Film Loops, preserved specimens, models, maps, demonstrations and discussions. The degree of study would vary with the grade level involved.

NOTE: The following are only some of the activities that appear in the booklet.

FIELD TRIP TO THE SEASHORE

Some factors to consider:

1. location
2. time of year
3. type of dress
4. tides (best observation & collecting is at low tide or low-incoming tide)
5. equipment
6. weather
7. degree of study

Materials and Equipment:

——plastic pails (one for each group)
——thermometers
——trowels
——compass
——seine net
——plankton nets
——spade
——stereo microscope
——large collecting pail (15 gal.)

High Tide Mark Study

SEASHORE ACTIVITIES ..... (IMPORTANT—Class is divided into small groups, 4 students per group. Each group begins at a different activity.)

1. Weather Conditions
   Date: _____ Sky: _____
   Air Temperature: _____ Wind: _____
   Tide: _____

2. High-tide Mark Study
   An incoming tide continually washes drifting material higher and higher onto the beach, leaving a long line, or mark.

   Comb through the material and record your findings below. Record all living things on the "Seashore Ecology" activity.

3. Seashore Ecology
   Complete chart below. Note all living things which you have observed, found or collected in your activities.

Living Thing	Zone	Habitat	ADAPTATION Food – Protection Reproduction

4. Seine Net Study
   This is perhaps the best single piece of equipment for collecting animals at the seashore waters. Specimens caught are often varied and numerous.

NOTE: Collect only the animals you wish to study, preserve or keep for an aquarium. Return all others to the sea. Practice Conservation.

* * * Observe, study and record your findings * * *

5. Plankton Study
   These tiny, and often microscopic plants and animals can be collected in shallow water. Wade out to knee depth. Continually move the plankton net through the water. Make sure the net is open and the collecting tube is below the water surface.

   After "working" the plankton net for at least three minutes, carefully hold the collecting tube to the light and observe!!! You should see many of the larger zooplankton forms.

   Record animals on Seashore Ecology chart.

6. Microscopic Study – Stereo Microscope
For a more thorough and interesting study, prepare some slides for the stereo microscope.

7. Temperature Study – Micro-climates
(Each student is provided with his own thermometer)

RECORD AIR TEMP.	RECORD SAND TEMP.
_____ at dune or marsh area	_____ at dry surface
_____ at upper beach	_____ at 6" below surface
_____ at lower beach	_____ at wet surface

RECORD WATER TEMPERATURE
_____ at surface
_____ at 2 feet below surface
_____ at 10 feet or more below surface
(if possible)

8. Tide Pool Study
Locate a few tide pools. Some pools may contain a wide variety of sea life. In addition to the specimens which may be collected, the tide pool offers an unusual opportunity to closely examine the unique adaptations of each of the animals.

Sit around the pool and observe how the animals feed, move about and sense their environment. Look carefully, as some of the animals are masters at camouflage.

* * * Record all living things you observe * * *

9. Pilings, Docks and Large Rock Study
The above objects are frequently covered with many interesting animals, such as barnacles, mussels, snails and crabs. Look below the water level for sea stars, sponge, sea anemones, shrimp, crabs and fish.

Collecting may be accomplished by prying, picking or using a small net.

* * * Observe, study and record all findings * * *

Discovery of Horseshoe Crab

"This female crab returns from the sea each spring to lay eggs within sandy beach – ritual which dates back some 3½ million years."

10. Thoughts, Feelings, Impressions
During a quiet period, try to observe as much of the seashore as possible. This, together with your studies, should enable you to write down some of your thoughts, feelings or impressions about the *Ecology of the Seashore.*

Back in the Classroom

In the classroom, a salt-water aquarium is set up with collected specimens. Periodically, small groups of students collect new specimens for the aquarium, which becomes –like the sea itself– a constantly changing phenomenon. Within this miniature biome, the observer sees and learns many things, including the dramatic, competitive struggle for existence among these marine animals.

Animal Worksheets

The role of the individual student as a creative thinker now comes into focus. Utilizing the marine animals collected for the aquarium, each student, at sometime during the week, is provided with an animal of his own – for intensive study, observation and experimentation. The Animal Worksheets are provided to serve as a guide for individualized study. However, the approach is basically non-directive, choosing rather to rely

– continued

TEACHING TIPS

PHOTO BY: ROBERT REDMOND

EXPLORING OLD CEMETERIES

AN OUTDOOR EDUCATION TECHNIQUE

By Dr. Thomas J. Rillo

Indiana University

Dotting the landscape in quiet, overgrown, and forgotten locations are many old cemeteries. The tombstones are weathered from the elements and some have fallen to lie in an undignified manner among the grasses and foliage which hide them during the spring and summer months. Others have been tilted from the growth of trees adjacent to them.

The inscriptions bearing names, dates of birth and death and in some cases a brief biographical statement, speak from the past to the individuals who are fortunate enough to discover such a veritable social studies resource.

Many historical events seem to come alive when viewed first-hand on the face of a sandstone, limestone, or granite tombstone. History can achieve "Heightened vitality" (John Dewey's phrase) when teacher and class take to the field to explore an old cemetery. This can be a rich experience carrying with it a sense of personal achievement, an element of self-discovery, of creativity, the Eureka effect. A rich experience should be the culmination or fulfillment of other experiences.

It is for this reason that a class outlines the problem of cemetery exploration before embarking on the field trip. Specific assignments should be accepted by small groups. Study guides or questions can be formulated prior to the field trip. Classroom study in Social Studies should be closely correlated with the field activity if optimum learning results are to be realized. The following questions might be presented as problem solving situations:

1. Find the oldest tombstone.
   a. From what material was the oldest tombstone made?
   b. Where is the oldest tombstone located in the cemetery – Front? Rear?
   c. How old was the individual who died?

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ART IN THE WOODS

By: Frances S. Bruyn
Art Teacher
Edgemont School District
Scarsdale, N. Y.

Art in the woods? What's that? Why would a school system send its art teacher to join the sixth grade for a week in the woods? The outdoor education program of the Edgemont School District in Scarsdale has included their art teacher and music teacher in all of their outdoor camping experiences for the past six years. Since I am the art teacher in the Greenville School of the Edgemont District, I can give you a few examples of why I am sent.

Nature and forms of nature have affected all civilizations since early man. Designs based on the forms of nature have been seen in the early caves, the paintings of the Egyptians, Romans, Europeans, Africans, South Americans, and throughout the United States.

What do the woods offer our children artistically? This article is based mainly on the very simple, but artistic and inexpensive projects that can be done in the woods. First ——

COLOR

Trees appear to be green, but are not to the alert observer. A flat piece of paper is green all over — — turn or twist the paper and it will not only change shape but tones of color. Roll it and hold it in a light and look carefully. One side is a very light green where the light hits, the middle area is a soft green, while the edge is a dark green because of the lack of light. Light gives color to all objects. Now — — look at a tree, a bush, or grasses — — if they were perfectly flat they would look like the sheet of paper. However none of them are flat, they curl, they twist, they turn and reflect the light in many directions, therefore they are never a flat green. Look very carefully and see the sunlight on a single leaf — — look more carefully and see the affect of sunlight on the entire tree. Look again — — are all the trees the same green? You must have observed that the evergreens have an entirely different tone of green than the hardwoods, and even the hardwoods will vary in shades and tones.... Not everyone notices this — — it takes a very special boy or girl to stop and look carefully to see this difference.

SKETCHING – –

Great!!! We are now looking and seeing! This is a good time to bring out many simple sketching materials. Crayons, chalks, pencils, charcoal, water colors, and poster paints are the simplest to include. Ask your students to find a comfortable spot to work, give them a cardboard or stiff board to work on, several generous size pieces of paper (12 x 18), and ask them to look around and find something that is really interesting to them. This could be an overall landscape, a small shed, a rotted log, a beaver dam, or even a close-up on some fresh new wild flower. Look at it closely for a minute or two and then sketch it as it "looks to you". Everyone will see the scene differently. Wouldn't life be boring if it looked the same to everyone? Encourage the student to look carefully – – see the full shape of a tree and how it varies from the shape of other trees – – or if it is a closeup of a plant, can they show the veins in the leaves, or the shadows in the depth of the flower? Many times they do not want to spend a long time on a single drawing – – fine! Turn the page and start another quick sketch. Quick sketches are as valuable for encouraging students to look and see as sketches that are labored over for many hours. The most enjoyment comes from the actual feeling that they are expressing different scenes of nature in their chosen medium. Be careful not to be over-critical and discourage their expressions as they may see the picture entirely differently from you. Modern art expression has encouraged all forms of designs and naturalism in the individual's work.

RUBBINGS – –

This is a really exciting form of art easily adapted to the out-of-doors and open to many interesting possibilities. Usually when I have groups do rubbings I have many sheets of inexpensive newsprint available for them to experiment with (size about 6" x 9"). Wax crayons or oil crayons are the simplest materials. Now what do you rub? Stop and Look! We are looking for textures, sometimes the simplest objects have the most fascinating textures. Over there is a young maple tree – – let's see what we can rub from the bark. First we hold the small sheet of newsprint as firmly against the tree as we can (sometimes small pieces of scotch tape or masking tape will help us) and then using only the side of a small piece of primary crayon we gently rub up and down, then side to side being careful not to tear the paper as we do it. Of course very rough surfaces are a little more difficult to rub but if gently done you will produce an excellent print. Next, let's rub a leaf, then a large stone, a smooth pile of sand, the walls of the cabin we are in, the screen on the window, gnarled logs, twigs . . . . keep looking and the possibilities are endless. Try to see how many different textures you can find. After the students have made these rubbings you have an excellent opportunity to discuss the structure of plants and leaves. They are now much more aware of the simple structures of plant life.

BURDOCK ANIMALS – –

Another suggestion for fall activities may come as you are looking for fall leaves. Perhaps you will see burdock burrs, if so, collect them and save them as they make an exciting project as well. Burdocks naturally stick to each other as well as to you. Take a few burrs at a time and arrange them in the general form of the animal you want to make. Think about the animal's shape – – tall and thin, short and fat, long or short legs and try to make this general shape from the burrs. Once you are pleased with the shape then using cotton batting cover your animal with a thin coating and gently pat it into shape. You may even add tooth picks as very simple legs, and sometimes spray paint for color. Final touches are; felt for ears, tails, noses, and any other distinguishing details. Simple but fun!

PINE CONE ANIMALS – –

I hope by now you are becoming more aware of all the many opportunities presented to you out-of-doors. For example, are you near evergreen trees with all of their varieties of cones? Collect them – large or small. Ask your students to look at them carefully to see what they remind them of,

CRAYON RUBBING

Dried arrangement using driftwood, dried grasses, stones, shells, feathers, and branches.

thinking in terms of birds or animals. What if you added heads or tails? What if you glue several together? You now have a cone sculpture developing and when everyone joins in you will have animals, birds, plants and other forms all coming alive from cones.

What if you pull a pine cone apart? Very simply pulled apart and laid in layers they can become fur, feathers, or other representations of textures on wildlife. Experiment – – if you don't try, nothing will happen. Entire pictures and collages can be made of parts of pine cones.

WALL HANGINGS – –

Another fall project involves collecting dried flowers, plants, and twigs. These combined with small pine cones and sewn onto burlap make a very pleasant wall hanging. Each student should have a piece of burlap, linen, or any plain material approximately 15" x 20". He then is encouraged to find interesting dried wild flowers and plants that he thinks are pleasant to look at. Encourage him to find some tall ones and some small ones so he can vary his arrangement. They should never be too large in diameter. He then arranges them in an interesting manner on his burlap. After they are arranged, he then starts sewing as carefully as possible from the back – – coming through over the dried flowers and back again, tying on the back. Each flower, depending on the size, should be tied two or three times. He continues until he has sewn all dried plants onto his burlap. Pine cones are especially good at the base of his design to cover all the rough stalks. After completed, he fringes about an inch at the bottom and staples the top to a dowel stick tied with a small cord. This makes a very charming and interesting wall hanging.

SPATTER PAINTING – –

Year around activities include spatter painting. The equipment is cardboard, any paper, straight pins, Flit gun, and colored ink. We work as a team gathering interesting flat materials looking for different forms and shapes. Once a team member has found several items he joins his partner and pins them to the paper which has cardboard behind it, so that the pins will held the shape firmly. All shapes must be pinned many times so that they lay flat and will not flop when the ink is applied. After pinning all objects, the cardboard is placed against a wall or tree and sprayed with the Flit sprayer from about two feet away. Caution must be exercised realizing the spray will hit more than the picture and anything in the background will also get its share of ink. After the picture is dry – remove the pins and you should have an interesting print. Leaves and plants that you have used in the rubbings will also be usable for this project.

Yes, these are only a few of the many, many ways to have Art-in the Woods or the Out-of-doors. These are the least complicated and the least expensive, but all are based on a simple principle – – STOP – – LOOK – FEEL – – AND SEE!!

Orienteering

A THINKING MAN'S SPORT

or

IT'S NOT NICE TO FOOL MOTHER NATURE

BY: *Irwin August*
SUNY Purchase

The Action Education Curriculum is new to the State University of New York, College at Purchase. But S.U.N.Y. Purchase has admitted students for just three years – so everything is new.

Our goal for Action Education is self-discovery for our students, staff and faculty. The joy of discovering that one can have fun with physical activity and not to have to compete with anyone but himself, time or nature. Naturally, the outdoor and wilderness experiences will play an important role in "self-discovery". The search for stimulating activity has ranged wide from circus to homesteading, from kayak-building to orienteering.

We are most fortunate to have in our "backyard" the former site of three U.S. National Championship Orienteering meets, The Ward Pound Ridge Reservation, and the man who brought the sport of orienteering from his native Sweden to the U.S. and Canada, Bjorn Kjillstrom, the founder and president of Silva, Inc., has met with us and given us materials and advice about orienteering.

This past fall, twelve pioneering students and their instructor began six-three hour sessions to learn orienteering. This is what the students and their instructor learned.

Orienteering is land navigation through unknown countryside with map and compass. It is a competitive way – with elements of a treasure hunt and cross-country running mixed together.

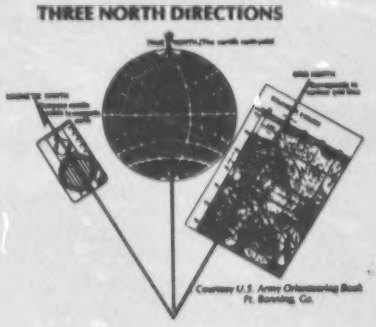
Bjorn Kjillstrom has stated, "The Orienteering program can be subdivided into two main parts. Specifically, there are the educational and theoretical aspects, which develop skill in map reading and love for the out of doors. There is the expanded development of this into a competitive sport with different variations ranging from single recreative contests, preferably combined with conservation and nature lore to the more intricate cross country races. Participants gain confidence in their own ability and skill, and develop proficiency and experience in fending for themselves in the woods. By so doing, they unconsciously assimilate a favorable attitude towards outdoor life of all kinds."

There is a skill progression which we followed that included: 1) maps, 2) compass, 3) competitive orienteering techniques.

A map is a reduced representation of a portion of the surface of the earth. The map maker uses symbols to represent the important details on the surface.

Orienteerers use topographic maps produced by the U.S. Geological Survey. Each topo is drawn to a specific scale. A scale is the proportion between a distance on the map and the actual distance in the field. 1:24000 is the scale best suited to orienteering and it means that 1 inch on the maps is 24,000 inches in the field or 2,000 feet.

THREE NORTH DIRECTIONS



Courtesy U.S. Army Orienteering Book Ft. Benning, Ga.

SAFETY CORD
COMPASS HOUSING (Rotates on Base)
NORTH ARROW HEAD - PARALLEL LINES AND LUMINOUS DOTS
DIRECTION OF TRAVEL ARROW (Bearing Reading)
MAGNIFYING GLASS
LUMINOUS STRIP
INCHES
0° to 360° with 2° GRADUATIONS
Courtesy Silva Corp.

A map gives a description of the area, usually a prominent location mentioned in the margin. Latitude and longitude are mentioned on a map which helps to show location.

Dates on the bottom of the map indicate how recent the map was drawn either from aerial photos or a survey or check.

To show details of the landscape, different signs called map symbols are used. Usually man-made, water, vegetation and elevation features are shown. The main difficulty is presented by contour lines. A contour line represents a given height of land. If you walked around a hill at the same height never going higher or lower you're describing a contour height. A contour describes the shoreline that would be formed by an ocean at its altitude.

A glance at the map will show relative direction which any point lies for any other point. The actual direction between 2 points has to be related to what is north and south on the map.

The topo maps frequently describe 3 north directions – magnetic north is the direction the compass needle points. True north is the direction of the North Pole. Grid North is northerly, direction the grid lines on the map are drawn. For orienteering purposes the angle in degrees between magnetic and true north is called declination.

In the eastern portion of the U.S. the declination (difference between magnetic north and true north) would be west and you would add the difference to find true north. See Figure 1. If a bearing (compass reading) was 96° magnetic and the declination was 11° true north would be 96° + 11° = 107°.

To find direction on a map find a longitude number along the top margin and the similar number on the bottom margin. Draw a line between these two lines – this is a north-south meridian line. Decide some specific spot on the meridian and that spot will be your "base of operation." Down the meridian line to the bottom of the map is south, up toward the top is north, left of the spot is west and right of the spot is east.

The simplest way to know direction on a map is to "orient" the map. To "orient" a map means to turn it in such a way that what is north on the map fits north in the landscape. Pick a spot on the map and twist it around to fit the surroundings.

The best way to determine distance in the field is by your step or by double step or pace. The length of a pace is about 5 feet. The terrain you cover will cause your pace to vary; also a running pace is different from a walking pace.

Another way of determining the distance covered is by elapsed time. The terrain covered and the distance between running and walking effect the distance covered in elapsed time.

The date the map was printed is important because of the number of changes in man-made structures and natural terrain in the interim.

Some interesting uses of maps as pre-orienteering drills are: 1) a landmark hunt, 2) map point walk – follow a marked route and indicate it on map, 3) map joint reporting – on map locate several landmarks then hike to different landmarks.

A pocket compass is the standard direction-finding device. See Figure 2. It will not enable you to find your position unless you have some additional information. The compass will give you constant directional reference, which can be used to keep you going in a straight line, to keep track of changes you make in direction, and establish the relation between directions on the ground and those shown on a map.

The three main purposes for which you can use the compass: 1) finding directions (bearings) for a location, 2) following a direction from a location and, 3) return to the original location.

To find a direction you want to determine hold the compass steady, turn the compass housing until the north part of the compass needle rests near the north marking of the compass housing. Sight across the center of the compass and read the number of degrees on compass housing facing you. This is the direction toward the landmark, expressed in degrees. This is a bearing.

To follow a bearing start walking toward your destination, rotate your whole body until you have the compass "oriented" – the north part of the compass is pointing at the 360° north marking. Sight through the center of the compass for your bearing and try to identify some landmark in that direction.

CLUE CARD

CONTROL	DESCRIPTION	SCORE
1	THE STREAM SOURCE	
2	THE WATER TOWER	
3	THE STREAM JUNCTION	
4	THE HILL SUMMIT	
5	THE CLEARING SW END	
6	THE ROAD AND THE STREAM CROSSING	
FINISH	NEW HEMPSTEAD SCHOOL	

To return to your original location take a "back bearing" and add 180° (number of degrees in a half-circle.) or subtract 180° if your original bearing was more than 180°. Again, "orient" the compass and sight your bearing picking out a landmark to head toward.

The orienteering compass produced by the Silva Co. has the conventional needle and compass housing but it also has a moveable orienteering arrow and a base plate with a direction of travel arrow. To find direction with the compass, point direction of travel arrow to landmark, turn housing until needle lies over orienting arrow.

There are several types of orienteering competition. Score Orienteering may be done without compasses, and the object is to gather as many points as possible by visiting as many control points as possible during the time allowed. The course setter must spread the control points and place more of them than can be discovered in the specified time.

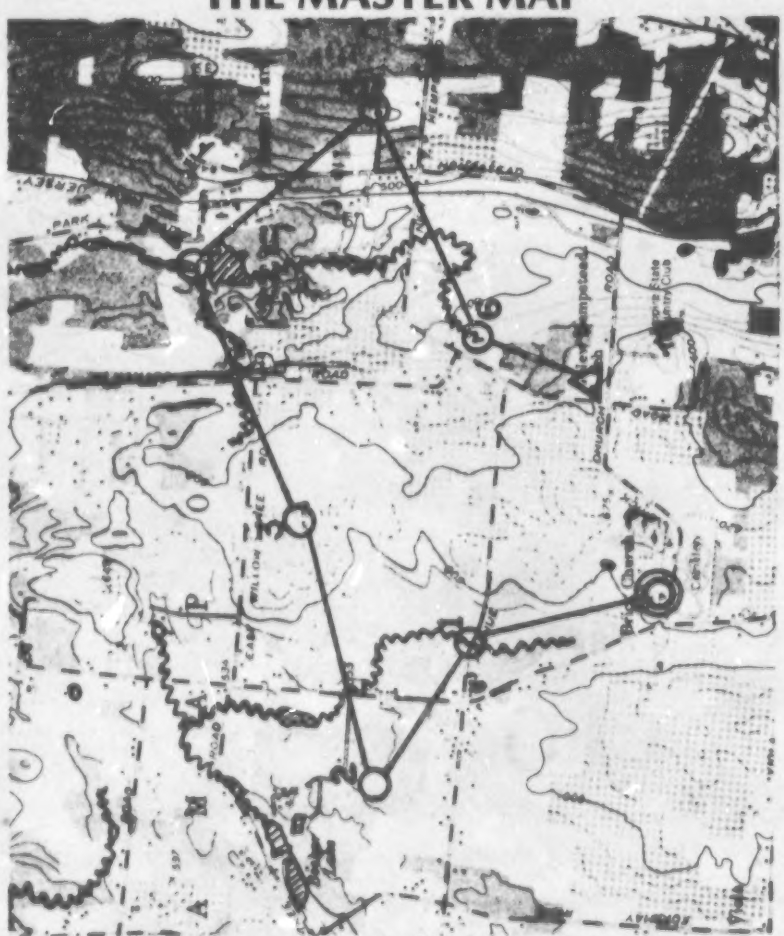
Every competitor carries a control description sheet and a map. They may locate each control by number while the description sheet describes the location of each control and gives its point value. See Figure 3. Each control marker carries an identifying mark or code letter which must be copied by the competitor to show that he has been there. A penalty system must be applied whereby competitors lose points when they exceed the time limit. No points are awarded for early finishing.

Start time is staggered for participants at 1-2 minute intervals. A commonly used method for conducting score in orienteering is by using master maps. One large master map for every 6-7 participants is set up away from the start area. Control points are marked with a red circle approximately 6mm in diameter on the master maps. See Figure 4.

At the start, participants are given a description sheet and map. They proceed to the master map area and carefully copy the control points onto their own maps. The participant then visits the controls chosen in any sequence desired.

Another type of orienteering is Cross-Country or Point-to-Point Orienteering. Winners are decided strictly on a time basis provided they have completed the course properly. After the start, where the competitors are staggered at 1-2 minute intervals,

THE MASTER MAP



Courtesy U.S. Army Orienteering Book
Ft. Benning, Ga.

the participants follow a well-marked route to the master map area where they copy the location of the control points onto their maps. The competitors must visit the control sites in the specified order. Each control is identified by a code symbol which must be placed on a control card. The code symbol may be stamped or punched onto the card or copied with a pen. See Figure 5.

Route Orienteering requires the competitors to follow a route marked with flags or streamers; as in cross-country walking or skiing. On the route there are several control markers placed on the trail. When a competitor comes across a marker, he must mark the location of it accurately on his map and copy the marker symbol onto his control card. Speed and accuracy determines the winner. This is a test of topo map reading, measuring distance, and the locating on one's position by taking bearings. See Figure 6.

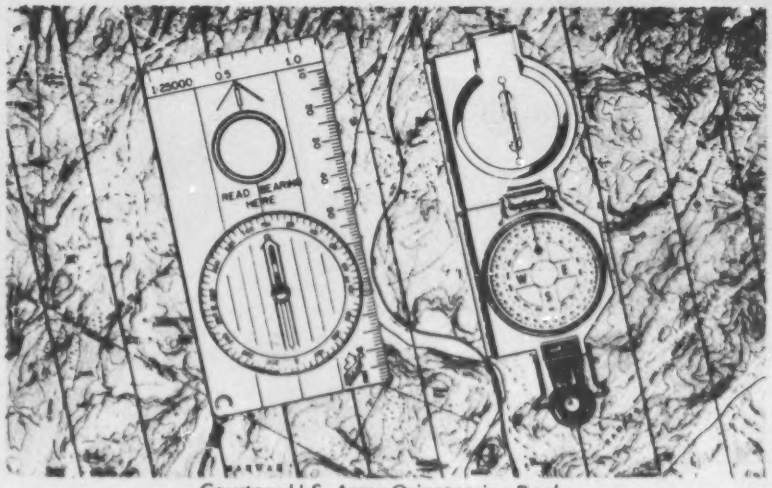
Night Orienteering can use either score or cross-country types of competition. All competition is conducted in the dark and markers are of luminous material. Competitors use flashlights or cavers' lamps strapped to their head. Night competition should be conducted in safe places like an enclosed park and in groups or pairs for younger competitors.

Neophyte orienteers many times lack confidence required for individual cross-country orienteering. Competing in pairs helps beginners.

Team competition in all types of orienteering can be conducted. Relays can be run in the regular track manner with each team member waiting for his preceding teammate before starting. Another way is to have all team members compete simultaneously over specified sections of the course and declare a winner in the total elapsed time of all team members.

Orienteering is a thinking man's sport. Choices of route are based on terrain, compass, and knowledge of one's own ability. The skillful orienteer can fool Mother Nature with successful navigation between control points. After a race, one can hear the competitors rehash their trips between markers. It is at these post-race get-togethers that orienteering becomes the vital, challenging sport that thousands of Europeans and Asians are flocking to. This sport is one of the last where man pits himself against nature and finds success or failure only because of his own skill or lack of it.

ORIENTING THE MAP WITH A COMPASS



Courtesy U.S. Army Orienteering Book
Ft. Benning, Ga.

AN ORIENTEERING CONTROL CARD

NAME TEAM

FINISH TIME,– START TIME,= TIME TAKEN

1	2	3	4	5	6	7
8	9	10	11	12	13	14

POSITION

LIST OF AVAILABLE MATERIALS

TEXTS

1. Chapman, J.R. ORIENTEERING, AN AID TO TRAINING. Printed in England by Hillside Printing and Publishing Co., 230 Woodhouse Road, Finchley London, N. 12 – (available in the USA from Silva Inc., or the Book Department, PO Drawer F, Fort Benning, Georgia 31905)

2. Disley, John. ORIENTEERING. Harrisburg, Pennsylvania 17105: The Stackpole Company, 1967.

3. Kjellstrom, Bjorn. BE EXPERT WITH MAP AND COMPASS. Harrisburg, Pennsylvania 17105: The Stackpole Company, 1967. (This is a hard cover edition)

4. Mustard, Major C.A. BY MAP AND COMPASS. Toronto: MacMillan Company of Canada Ltd., 1950. (This is a Canadian school book. Recommended as a beginner's text)

5. PATHFINDER ORIENTEERING AREA. La Porte, Indiana: Silva, Inc., 1958. (Excellent for setting up a clinic or orienteering)

NOTE: All texts are available from

Silva, Inc.
Highway 39 North
La Porte, Indiana 46350

SURVIVAL...

As Part of The School Curriculum

By: Joseph Freitus
Sudbury, Massachusetts

The Survival Living curriculum being developed at the Lincoln-Sudbury Regional High School, Sudbury, Massachusetts, attempts to develop in one semester those skills that young people today can utilize in a positive survival situation. Anyone can suddenly find himself totally dependent on his own resources, yet with very little time and money, an effort can be made to develop skills that will prepare an individual for emergency situations.

With man's greater and greater dependency on technology, he becomes further and further removed from his natural environment. Thus, when an unexpected situation arises it could become a survival situation because man, by in large, no longer lives comfortably in his natural invironment. The purpose of this course is to help the student develop those skills that are basic and necessary to make a person comfortable in a natural environment, and not one of frustration and panic.

FACULTY

The course is conducted on an Inter-departmental basis, therefore the staff is drawn from various school departments of the Regional school. Each of the faculty members has a wide range of experience in survival skills. Four faculty members are directly involved with the day to day responsibilities of organization, planning and the teaching. However, many other faculty members are drawn into the program from time to time to add their particular expertise, as are local members of the community.

Additionally, the many talents of the Regional Outward Bound Staff of Hurricane Island, the Regional School's Nimbus Program (Outward Bound Program), as well as other resources are tapped as a backup and reinforcement for the course. The Survival Living program is conducted at the Elementary Grade level, on a limited basis as well as at the Regional School.

While it is the object of much of the curriculum in the schools today to prepare a young person to live in a scientific age and world, the Survival Living program and faculty are charged with the responsibility of seeing that the student lives comfortably knowing that he can feel at ease and confident in the natural world as well. To this end the faculty strives to present students with similar complex situations as found in the natural environments, which will hopefully help the student understand his needs for basic skills. Once the student develops these skills, he is offered an opportunity to test and evaluate his capabilities in an artificial survival situation.

CURRICULUM OUTLINE

The curriculum is based on the premise that actual survival can not be taught to or at a student, rather basic skills will enable him-her to control an emergency situation and thus survive. With this premise in mind we also realize that the will to survive can not be taught and so we attempt to develop a confidence within the student so that he has the will to survive should the situation ever demand this as a part of his psychological make-up.

The course or program therefore encompasses the following aspects:

1. The philosophy and psychology of survival, as well as stress, panic, fear and morale problems.

2. What to do when you discover you are lost.

Students learning to start fires with no matches and then cooking edible wild foods meal.

Student starting a wild edible foods meal

3. How to locate direction with or without a compass, the use of natural devices that have been used by man, and utilization of a map, etc. etc.

4. Construction of a variety of fires needed for warmth or cooking, as well as some of the problems inherent in fire building. Types of woods desired in fire building and how to start fires without the use of matches.

5. The use of edible wild plants, their identification and utility, as well as medicinals, menus and preparations.

6. The construction and use of snares and traps to obtain the valuable animal protein.

7. How to devise a multitude of shelters for a variety of situations and locations.

8. How to stay warm by proper clothing, construction of emergency clothing, sleeping gear and caloric requirements for a variety of cold weather situations. The ever present threat of hypothermia and its prevention.

Starting a fire using a fire tong

Boiling water using hot stones

9. The all important locating water sources and its requirements by the body in a survival situation.

10. Forecasting the weather in the wild. Knowing some of the subtle change agents that indicate changing weather patterns.

11. First aid that can be utilized in the wild as well as the basics of General First Aid skills.

12. Basic campcraft, such as the making of cooking utensils, snowshoes, travel devices, and other skills addenda to living comfortably in a survival situation.

13. The art of staying out of trouble, which means the interpretation of signs and situations found in the natural environment that become hazardous. Landslides, swamps, animals, snowslides, emergency survival kits and many more.

In addition to these specifics as found in the basic program outline, other aspects, such as living in new surroundings that may induce a cultural shock are presented. Members of the faculty who have served with the Peace Corps, lived with Eskimos, and other unique situations are presented to students for their cnsideration.

Elementary students building a snow shelter as part of an elementary survival course

Where Did All The Hemlocks Go?

By: WILLIAM DEVLIN
Director
Frost Valley Center

The old tannery chimneys that dot the Catskills stand as tombstones of the old leather industry and of countless majestic Hemlocks which fell to man's inadvertency more than a century ago.

Looking at the deciduous Catskill forests of maple, birch, and beech, it is difficult to imagine that vast areas were once almost totally Hemlock.

The site that greeted the first European's eyes here from a high vantage point was an unbroken carpet of blue green, interspersed with shadows of black. This was the view that the vast uninhabited areas of Hemlock gave to the entire countryside. The immense spreads of Hemlock timber made the Catskills an island in the midst of the westward push of civilization.

But around 1817, upon the discovery of improved ways to tan leather using the bark from the Hemlock, tanners rushed to the Catskills, purchased large tracts of land covered with Hemlock, and erected extensive tanneries. Then came the sawmills and the villages, followed by the wooden turnpikes, canals, and railroads; those inevitable transportation routes to link them to market.

In about 30 years, from 1840-1870, these mountains were made barren. A seemingly inexhaustible supply of unbelievably huge Hemlocks had fallen to the greed of men with everything but the bark being wasted. It was felt that bark was cheap, as well as labor, while leather was dear. The statement that "bark was cheap" might well be revised by taking into account the value of a forest of Hemlock timber skinned of its bark and left to rot on the disgracefully wasted mountainside.

Since the raw hides were less bulky to transport than bark, hides were shipped to where the bark was plentiful and factories for the tanning of leather sprung up wherever there was bark to feed them. Roads suitable for heavy loads pushed up every timbered valley. Peelers, with spuds in hand, went into the woods about May 1, peeling the Hemlock as long as it would peel, and stacking the bark in cord piles to dry and be drawn to the tanneries. It was skidded out summer and fall when the season was dry, or on winter snow if necessary.

The tan bark was ground in a water-powered mill, then taken to a leach house, mixed with boiling water and left to steep for about a week. The liquid was then ready to be drawn off for the tanyard vats as needed.

Hides were first put in vats in the beamhouse and soaked for about a week. They were taken out, pounded till soft, and split down the middle. These sides were taken to sweat pits and left for 5 to 8 days. To know when the hides were ready to be taken from the sweat pits, workmen rubbed a thumb over them. If hair could be rubbed off with a thumb, the sides were ready to be milled or pounded to remove the bulk of the hair. The odor on opening these pits was terrible, and made the eyes run. Beam hands went to work to scrape and clean any remaining hair or flesh from the hides.

Next they were treated to plump them, opening the pores so the leather would take a tan. Handlers put them one by one flat into a vat of weak liquor solution. A shovel full of tanbark was scattered on each side as it sank. This kept the sides from settling too close together. After three weeks, the sides were turned over and the liquor was made stronger. Again, at the end of three weeks the hides were changed and again laid down in strong liquor for three months.

This ended tanning, and the hides were put in a loft to dry. When dry,they were scrubbed and treated with fish oil and

Photo by: William Devlin

hung up again for a short time; they were taken down for the last time and treated with tanners oil and rolled for easier shipment to market.

When you think of the thousands of untreated raw hides that had traveled from the ends of the earth, slowly and without refrigeration, you may imagine the stench that hung over the tanneries.

Tanneries varied in size from very small establishments employing three or four workers to large week-planned operations such as the Palen Tannery built in the year 1832 on the falls of the Neversink Creek in Sullivan County. Its main building reassured 40' by 350' and contained 160 tanning vats capable of holding 25,000 sides of leather. In operation, the business required 4,000 cords of Hemlock bark yearly (a cord is equivalent to about 1 ton of bark). About 40 workers earned their living under the roof of this one building while more men were needed to harvest the hugh amount of bark.

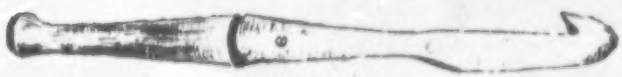
The Claryville Tannery, built in 1848,was even larger. It employed 50 men and tanned 30,000 sides of leather annually.

During this period, the Catskills produced the finest leather in the world, but by 1870, leather production was declining in the Catskills and the population declined with it. In 1860, the town of Neversink had a population of 2,130 people compared to 1,555 a hundred years later. On this page is a photograph of the Bushnell tannery in Claryville, New York.

The effect of the leather industry upon the forests in this area is related in the book, *Picturesque Ulster County* (1896) which comments about a photo at the site now occupied by the Frost Valley YMCA Environmental Education Center, "the grounds about the buildings are well wooded, an unusual thing to find in this part of the country." Thanks to someone who refused to sell out to the tanning bonanza, Frost Valley today boasts a few virgin Hemlock trees.

Had the heavy exploitation of the Hemlock been postponed some twenty years modern technology might well have prevented the complete disappearance of the Catskill tanneries; because new tanning compounds and labor-saving machinery were finding their way into American manufacturing. But the mountains ran out of Hemlocks before this happened and no amount of enlightenment can now restore these tanneries or the great Hemlock forests that played such a brief and dramatic role in the in the history of the Catskills.

On the other hand, it has been said that the Civil War was won with leather from Sullivan County, New York, so that one could imagine that had the exploitation of Hemlock been



postponed by only one year, it might have effected the outcome of the Civil War.

The evergreen cemetery at Bethel, New York, was named for one of the Catskill's last documented virgin Hemlock trees, which now stands over the grave of the man who was clearing the land for a cemetery. He was killed by a limb which fell from the tree in 1813. Imagine its age today if it had a limb large enough to kill a man 160 years ago. On the slopes toward Doubletop Mountain one can still find the remains of logs wasted by this industry of the last century. I am also told that there are still to be found a few piles of forgotten hemlock bark, green with moss, just as they were peeled over a hundred years ago.

There is a bridge across the Neversink Creek at Frost Valley whose main beam is the trunk of a 300 year old Hemlock. The stump on the far bank still documents its age. Had the sawyer realized that he was cutting into a Virgin Hemlock I would hope that he would not have cut it and the tree would still stand today. The stump is being preserved as a reminder of our lack of awareness.

The Hemlocks are almost gone, but I hope the old chimneys stand forever. As long as they stand others will ask as I did, "What were they?" As a result many will learn a new appreciation for life. Maybe if they stand and continue to tell their story the Hemlock will be allowed to return to something of its original magnificence. It will take many centuries – but if people understand, and care, there is hope.

Credit for the information in this article goes to the book, Brass Buttons and Leather Boots, published by the Sullivan County Civil War Centennial Commission of the Sullivan County New York Historical Society in 1963.

ENVIRONMENTAL CRISIS — A TASK FOR EDUCATION

By. Dr. Donald R. Hammerman
Head, Department of Outdoor Teacher Education
Director, Lorado Taft Field Campus
Northern Illinois University

"Human history becomes more and more a race between education and catastrophe." -- H.G. Wells. Growing recognition of the need to preserve a healthy, wholesome, environment brings new light to these words. As the movement to improve the quality of environment and of living gains momentum education's role in this mission becomes increasingly significant.

Environmental Rundown

Over the past several years we have been subjected to a multi-media bombardment of environmental alarms, proclamations and calls-to-arms. Listed below are some of the more highly publicized developments. One obvious danger of singling out a few specific actions for mention is that one can barely scratch the surface of all the activity that has been triggered by the current concern for environmental quality.

President Nixon established a Council on Environmental Quality. Congress passed the Environmental Education Act. As a result, various states held conclaves to develop State Plans for Environmental Education so they could be in the vanguard of those to benefit from the federal largess. By the same token regional conferences have been called hither and yon to lay out and discuss implications of environmental education for developing new curricula and new degree programs. Conferences of this sort have been held at University of Wisconsin, Green Bay, and Madison. The theme for the Conservation Education Association Conference, 1971 at the University of Michigan was, "Environmental Crisis: Root Causes and Opportunities for Solution."

Various curriculum models for environmental education have been devised. Minnesota created a K - 12 model. South Carolina published a series of guides (the result of a six year project). The National Park Service has its NEED program.

The National Education Association established an Environmental Task Force. The American Association for Health, Physical Education, Recreation has Project ME, Man's Environment. The Thorne Ecological Foundation sponsored a Seminar on Environmental Arts and Sciences at Aspen, Colorado to fashion an Environmental Bill of Rights.

For a number of years well established organizations such as: the Izaak Walton League, Conservation Foundation, National Audubon Society, Sierra Club, National Wildlife Federation, and Wilderness Society have worked actively to prod the general public to greater environmental awareness.

The environmental movement has given rise to countless new organizations that have sprung up like wildflowers dotting the landscape. Among these are: Environmental Protection Agencies, Friends of the Earth, Student Councils on Pollution and Environment, (SEEK) Services for Environmental Education Communications, Inc., Environmental Action, Student Environmental Consulting Services, Zero Population Growth, Environmental Action Coalition, National Ecology Foundation, and Ecological Action Environmental Institute, plus a host of newly founded Ecology Centers. These, along with the above organizations, disseminate their own materials and news organs thus contributing to the mountain of paper and print dealing with the environment.

Not to be outdone the media producers are churning out films, filmstrips, filmloops, resource guides and worksheets to capitalize on this new market. Industry, too is getting into the act, as they should, through somewhat different means than pollution control. They are coming out with newly designed environmental games. Coca-cola has a kit called, "Man In His Environment." It contains two games: (1) "Make Your Own World," a role playing game for upper elementary and junior high students, and (2) "Mars I -- Spacecraft," geared to the lower elementary grades.

We are in the midst of an environmental information explosion that threatens to bury us in a sea of words and paper. We have been inundated with a flow of environmental warnings and pronouncements, many bordering on prophet-of-doom prognostications. One begins to wonder if the real threat isn't that of environmental propaganda overkill. In some respects the flood of environmental information has reached a super-saturation level.

A very brief example of this type data-information follows: A child born today will, under our present system of waste disposal personally pollute three million gallons of water during his lifetime, with nineteen tons of sewage solids dumped into our rivers and streams. Further, industry and agriculture will pollute an additional thirty million gallons of water to provide food, products, and services to this same child. Unless we change things, this same newborn infant will junk or abandon two-and-one-half cars during his lifetime and will use 21,000 gallons of gasoline containing pollutants like lead or boron. Some experts predict we have twenty-five years left, others only ten.

Thus the media continue their verbal and visual bombardment pertaining to environmental degradation, thermal pollution, water pollution, noise pollution industrial pollution, people pollution, and so on. Environmental crises which affect all segments of society ultimately pose a challenge to society's instrument of change -- education itself. To implement behavioral change of the magnitude required, calls for educational retooling on a massive scale.

Implications for Education

Interestingly enough a number of schools for a number of years have developed and experimented with a type of educational retooling not too far removed from the approach required to first, create an environmentally aware and informed citizenry, and second, develop a cadre of professional educators equipped to teach about man and his environment in different environmental settings. This curriculum development is known as "outdoor education." What is there about the outdoor education approach that lends itself to environmental studies?

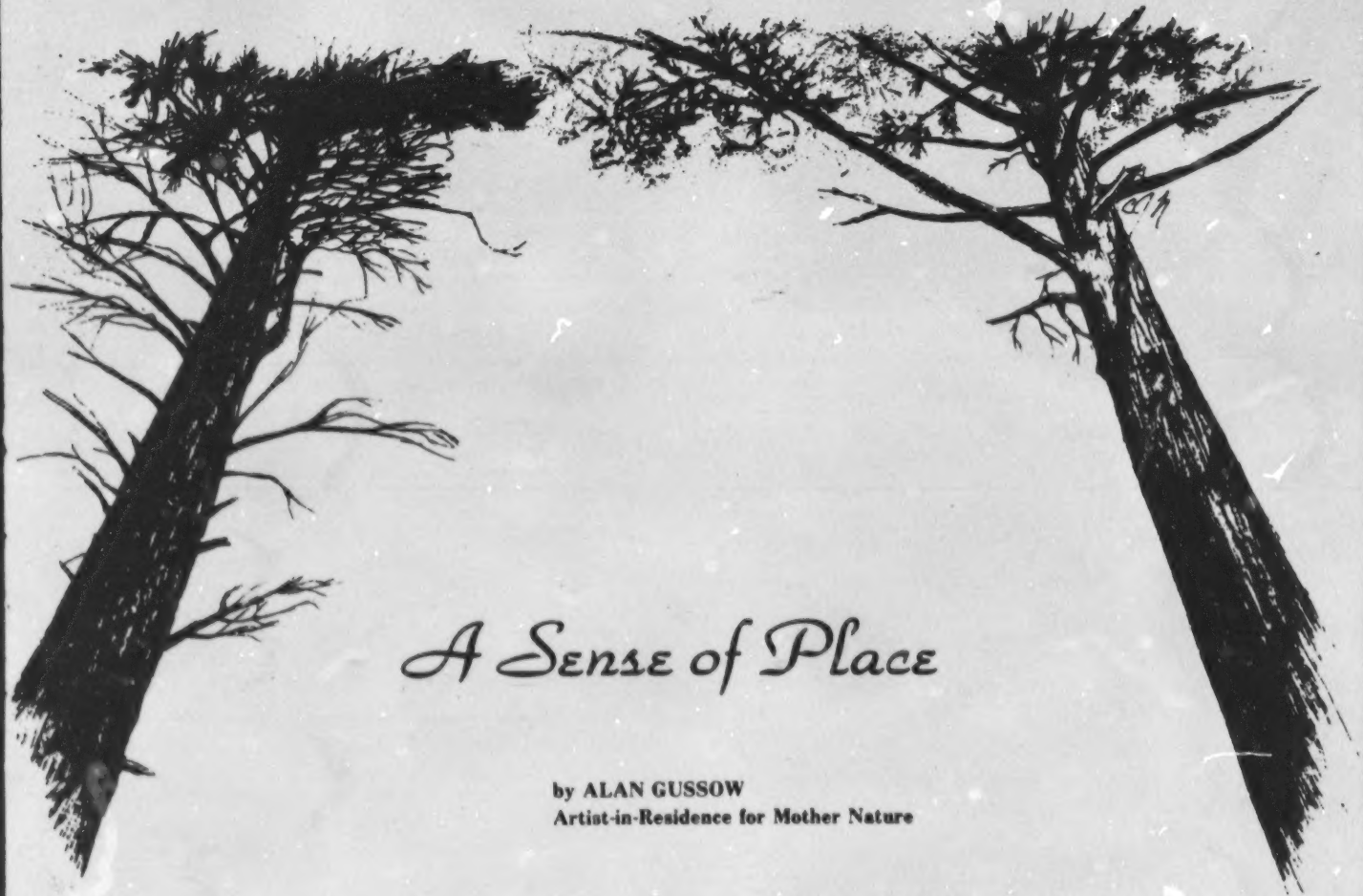
First, is the approach to teaching and learning itself based on the principle of firsthand investigation of that which is being studied. Environmental studies should involve more than merely reading about the environmental crisis, or being talked to by an expert on environment. To become truly environmentally aware the individual should be exposed directly to some of the environmental problems confronting mankind. Exposure should entail a good deal more than mere observation. To be most effective these environmental confrontations should include: (1) inquiry into the nature of the problem, (2) data gathering, (3) posing potential solutions, and (4) action-involvement. Through this process the individual not only develops a sensitivity to environment but he becomes action-oriented. Action-oriented, that is the key. Concern, wringing-of-hands, and rhetoric are to no avail if it does not lead to behavioral change and action.

Implications For Teacher Education

What does any of this have to do with teacher preparation? The challenge is indeed sobering for it requires new and different strategies to traditional teacher education. Courses and clinical experiences dealing with environmental quality and environmental problem solving are but one approach. Entire curricula need to be designed around the theme, "Man and His Environment," as is being done at the University of Wisconsin, Green Bay. There are not yet any "best ways" to do this. Different approaches are being tried. The relatively new area of environmental education is such that few developments have had an opportunity to stand the test of time.

The problem, naturally, is a great deal larger than a problem for education alone. It is society's problem. A problem-task that confronts local, municipal, and federal government. A problem that industry, large and small, must face. Yet, in the final analysis, all segments of industry and government involve people -- and the starting point for change is through people, which leads us directly to the educational instrument of society -- the schools, and finally to the change agent in each classroom -- the teacher.

The current need for environmental education as an integral component of every teacher's professional preparation seems very clear. The quality of our environment may ultimately depend upon how effectively the teachers of this land are prepared to deal with environmental studies. Let us hope that education is equal to the task. Mankind's survival could well depend on winning this particular race between education and catastrophe.



A Sense of Place

by ALAN GUSSOW
Artist-in-Residence for Mother Nature

"A place is a piece of the whole environment which has been claimed by feelings."

Editor's Note: The following article contains excerpts from the major presentation by Alan Gussow at the N.Y.S.O.E.A. conference last October.

Outdoor education, as I see it, is more than the education we receive in beautiful and sublime natural country places. Another way to define outdoor education is to say - the world as teacher. If you accept this idea of the world as teacher, then outdoor education is more, much more than those precious times when we stand on mountain tops and view distant hills. It is what we learn by looking about us. And of course, it's very important where we all look about. And your role, in viewing the world as teacher, is to help your students to open their eyes to the real world, to see the world all around, to see it unflinchingly, and to see it whole.

We cannot, and should not confuse outdoor education with nature education or just plain nature. Mark Terry, in his book, TEACHING FOR SURVIVAL, makes all education environmental education. He says, "There is no escape from environmental education because environment is desks, blackboards, classlights, bulletin boards, teachers, office records, lights, windows, PA systems, and grades. Each of these things is as much a part of the earth's household as any other. As each teacher approaches and interacts with every aspect of the school day, he is providing his students with a model environmental attitude." This is a very, very basic statement. He goes on, "Everything you do is teaching an environmental lesson. The school builds an addition to the parking lot. That's a very bad environmental lesson."

Buckminster Fuller's definition of environment is that the environment is everything that is not made - which is a very good way of putting it. The outdoors is everything under heaven.

We have heard much about the major academic disciplines, the sciences and the humanities. I think that outdoor educators are really teaching the humilities, because truly to understand our place in the world around us is to understand human frailty, to understand the limits of man and mankind. And what you want, of course, is to have your students sense the interconnectedness of things, to see that they are only a part of the whole ecosystem.

This leads to a second major role of outdoor educators which is to have your students experience parts of the world which through confinement, reluctance, fear, and perhaps civilization, they have not experienced. And that is the world of forests, glens, peaks, shorelines, and skies. . . a world that's out there every dawn and every twilight, a world that is filled with

wonder and with potential for discovery. It is a world beyond the boundaries of the circumscribed lives of many of the city and suburban kids today. I know, for example, that city kids simply just don't see stars or eat snow. They don't know the pleasures of eating snow. A teacher once was horrified at the suggestion of having students eat snow. The idea was that you wouldn't eat snow because it would melt what is falling in it. You have got to get people to places where they can see the stars and eat the snow.

What you have to do is to help make students less civilized. Stanley Diamond, an anthropologist, once wrote, "Civilization is, so to speak, a lack effect, a human laziness, a willingness to accept the perceptions and decisions of others in place of your own, to be less than a full man." Part of your role is to de-civilise or uncivilize your students. Poet Gary Snyder said it more succinctly. He said, "A hand pushing a button may wield great power but that hand will never learn what a hand can do." He was talking about unused capacities. We need to help students to develop a feeling for their world, to develop a comradeship with the earth, such as the "less civilized" Australian aborigines, for example. And this comradeship is not going to come from pictures. One doesn't develop a sense as a spectator.

Michael Collins, the astronaut, and third man in the first moon journey, in his book, CARRYING FIRE, speculated on many things about his adventure. He says, "Seeing the earth on an eight by ten inch piece of paper or ringed by the plastic border of the television screen is not only not the same as the real view, but even worse. It is a pseudo-sight." A great phrase! "It is a pseudo-sight that denies the reality of the matter. To actually be 100,000 miles out, to look out four windows and find nothing but black infinity, to finally locate the blue and white golf ball in the fifth window, to know how fortunate we are to be able to return to it...all of these are required." Of course, we are filled with pseudo-sights, and I would rather have you take some students out and see something very simple, but really see it, than to load them up with a lot of pseudo-sights or vicarious kinds of experiences. In our order of priorities, we've got to get students out there and have them experience these things for themselves.

What I really want to zero in on is the subject of **self and place and communication of experience.** How are we interacting with the world? And how can we share with others those times and those vocations which have had special meaning for us? All three are important: self, because we must understand that we are part of the world not merely as a witness to events, but as participants. It is important that the self be understood in terms of something interacting - that you are continuous with nature. Moving through life, we claim places. Place is a very special word. The notion of place is a result of experience in our own immersions. And, it is through communication that we assert our humanity.

It is not only our species' survival that is at risk, but it is our very humanity. Unless we can give shape to our feelings, unless we can learn to share, we run the risk of forgetting that we are more than animals. We are animals, of sorts, but we are more than animals. We are people, we are individuals, and each of us has a mind capable of remembering, moving in and out of time, trying desperately to resist this neo-barbarism which is stalking the planet.

And who are we as people? We talk about self. What is self? Edwin Mason once said, "It would be truer to say that we preach what we practice than vice-versa." We preach what we practice. It is an interesting way to think about it.

Often we hear others describe us and very often it doesn't really describe us. After an introduction for a talk once, I said to myself, "You know in some strange way, that doesn't describe me...what I am as a self." So I sat down that night and wrote out some of the things I do. I wrote the line, "Here are some of the things I do". If what Mason says is true, that we preach what we practice, then what is really important to me as an individual, as a self, is what I do, not a lot of other stuff.

It might be well worth asking your students some day, "What do you do? All right, don't give me lessons, don't feed me that. What do you do? That's what you are."

It is important to think of your life in terms of the things you really **do**, not the things you **think**. What do you really do? Kids ought to be aware of what they do in a day. Maybe they will begin to have an awareness of themselves and that they are not nearly doing enough.

One way to understand who you are is to recognise that each of us is the product of a series of environments which have shaped us. Our self does not exist in a vacuum. We are formed by the world. Students need to get to know the edges and overlappings of the individual and the environment. Students should attempt to define themselves...sizes, shapes, gestures, skills, appetites, pleasures, and fears with particular reference to the role of the environment in shaping their character. They can research their home and their families' histories, the houses and apartments they have lived in, the streets and communities that they have been a part of, through maps, geneologies, photos, charts, and oral histories. Journals can be employed to document the uniqueness of each student.

You can go to your grandparents and talk to them about your father's and mother's childhood. Your father and mother never lived the way you do. They don't quite know what their childhood is all about. It is very disoriented. But your grandparents happen to know what your father's and mother's childhood was all about. It is a fantastic experience for kids to really find out that their parents were human, that they were children, that their parents had some of the same problems and interests, and that the times were different and in what ways.

Write in your journals about yourself. Write "I am" and then put everything under it you can think of. Then list things that you need, things you own, the contents of your secret drawer! Empty it, dump the contents, write down everything that is in that drawer and on the other side of your book what you were thinking about as you looked at the objects. Students should write descriptions of their houses and camp out on their property. They can camp out and get to know the animals on their property, if there are animals. For some students I know, this was a thrilling experience. Their backyard was there all the time and they had never thought about camping out.

Walk up to your house...think about it and ask yourself, what does it suggest? This all has to do with the notion of self. We see ourselves more clearly and as others see us.

The second thing I wanted to talk about was place. In this country, at this very moment, we are very conscious of man as a violator of his environment, a destroyer of the earth's lovely places. The notion that man is also a place-maker and ultimately, the product of the places that he himself has known, is really the marvelous idea of the sense of place. In thinking about the conservation of the environment, I gradually have come to realize that environment is not a place, that the words are not interchangeable and that the difference is critical. There is a great deal of talk about saving the environment. We must, because the environment sustains our bodies. But as humans, we also require support for our spirits, and this is what different kinds of places provide. The catalyst that converts any physical location, any environment if you will, into a place is the process of experiencing deeper. A place is a piece of the whole environment which has been claimed by feelings. Viewed simply as a life support system, the earth is an environment. But viewed as a resource that sustains our humanity, then the earth as an environment is really a collection of places . . . a very important distinction. We never speak, for example, of an environment we have known. It is places we have known. You think about it and recall . . . we are homesick for places, we are reminded of places. It is the sounds and smells and sights of places which haunt us, and against which we often measure our present.

Now most places are by their very nature private. They are the products of an encounter between a single individual and his surroundings. That is also very important. And one way, to use a model or example of this, is to think about our relationship with our houses.

The whole earth is indeed a household. I think the interesting thing in going out with students is to think about this idea. Does the land suggest certain kinds of overtones, overfigures? Each of us individually is a placemaker, each of us has private thoughts that we treasure, places that we have at least mentally set aside. And the question is what is it about certain spots, certain locations, certain environments which permit them suddenly to become places in our minds? All of us travel. We see the cities, we visit shrines, we take walks, we climb mountains. Yet it would be inaccurate to say that everywhere we go becomes a place.

Photo by Tom Maguire

Areas that others have set aside are their places. However much we know about them, they do not become our own except by direct experience or close to direct experience. But a place that we have heard about from others, once experienced, does become a part of us, our own in time, and it enhances our feeling for the place and for those who have come before. There is in the notion of place an element of the historical which is missing from the idea of environment. And I think this is very important to understand.

Making places is important and part of you because we do get to know ourselves better through the experience. Some ideas you might try. Choreograph a walk downtown or in the woods. A college student developed a nature walk which I think is a terrific idea. He recommends that it be taken alone and suggests, "Pick a warm spring day, begin your walk, get to the first footbridge, go down to the water and taste it, see how cold it is, notice the force against your hand, take a deep breath, notice the woodsy odor, break off branches, twigs, and so on." And it goes on as a way designed to encourage a kind of participation. But one of the most interesting parts of it, to give you a feeling for his great creativity, directs you to "look in a pine grove, off the light post number nine. Notice the grove is located in the dried river bed. Go into the river bed and walk about 15 yards to the left. Come running back as if you were the water in the river. Be particular in the way you run over the land. Try to meet downstream in the same manner that you feel the water once did." I think that is a terrific idea. This is one thing that needs to be constantly pointed out. It is one thing to have your taxonomy, to have your names, but the experience is the way in which to claim the place. And I think to run down a dry river bed as if you were the water filling it up after a rain . . . that's a terrific idea. It is that kind of thing that is essential.

Another thing about place-making is to meet nature on something that resembles nature's terms . . . such as a night walk, without a flashlight. Wendell Barry once said, "To go from the dark to the light is to know the light. To know the dark, go dark." And that of course makes all the difference . . . to know the dark, go dark.

When climbing a mountain, a friend of mine always wore sneakers because he liked the information that he got through his feet. He said that if he wore heavy boots all the time, then he wasn't getting any information. Those of you who climb rocks know that you get information from your feet. We need to be sensitive to those things.

A Sense of Place

Ella Leopold has said, "Wilderness is the raw material out of which man has patterned the artifact of all civilization." It is out of this raw material and our experiences that we make art and communications. With these experiences and insights into themselves and their relationships to the world around, students are able to probe the possibilities of communication of their personal and environmental perceptions through various art forms, including painting, crafts, photography, dance, and theater. In other words, now that you have had these experiences, now that you have learned something about yourself, can you begin to really share, can you begin to give some structure to it? To be able to share... it is a way of saying that we are human.

Since I am essentially an artist, one who draws upon my experiences in nature as a source for paintings, it would be tempting to continue to make a case for the artist as a means of interpreting the world. But you all are primarily outdoor educators, though I suspect that more than a few of you are poets, painters, maybe potters, weavers, or photographers... what I call secret artists. But most important, you have the view of the whole earth, a view which is desperately needed now. You know the seasonal delight of country time. You know the delights of learning your way to hidden parts of the forest. You know the pleasures of self-discovery in nature which come when you have met a challenge and you tried it. In the schools of our country, you should be at the center of the learning experience, inviting not only the science teachers, but the English, art, dance, history, physical education, and all the teachers to join with you in leading students into the outdoors... into the windy, and mysterious, and often I think very beautiful world. You can lead them into the natural places. You have the skills which can give the students, and honestly, perhaps, some of the other teachers the reassurance that they can extend their experience into the wilderness and return.

At an Indian council in the Valley of the Wallawalla in 1855, a young Indian chief of the Cayuse asked this question and offered his own wise answer, "I wonder if the ground has anything to say. I wonder if the ground is listening to what is said. The Great Spirit, in placing men on earth, designed them to take good care of the ground, and to do each other no harm." Wonderful, wonderful statement. The ground, of course, has much to say... much to teach us. And you are the ones who have been chosen to lead the rest of us to the places where we may clearly hear its mumble.

THOUGHTS..... photo by norman skliar

To a TOAD, what is beauty?
A female with two lovely pop-eyes,
A wide mouth, yellow belly and
Green spotted back.

Voltaire (1694-1778)

4. Manipulative

Perhaps no other method of learning is so motivating as that which is project involved. Thinning, pruning, woodcraft, reforestation, trail development, establishment of feeders and houses for wildlife, are all workable projects which relate to woodlots or forestry. Perhaps they are most appropriate for those involved in vocational curricula. Whatever the group, however, it is important to remember that such sessions fall short of their fullest potential, if they are simply isolated experiences without proper preparation in both technique and perspective. Children should have more than tired sore muscles to remember and talk about when they are finished.

Some Things to Think About in Preparing for the Field

Those who have never been in the woods may be in the majority today. Some may be apprehensive, if not downright frightened, at the prospect. Considering the folklore of the frontier, this is understandable, but it is far from realistic. In most places, poison ivy may represent the greatest threat to a successful trip. If you know how to identify it, and know something of its ecology, you will be able to avoid it.

Once you have decided upon the approach you will use, you should plan for proper clothing, equipment, and a variety of other details. Norman Skliar's article on the Seashore Environment (Communicator Spring 1971) has good information on these details. By thinking of the basic differences between the woods and the seashore, you should be able to adapt this planning technique to the woodlot.

If you are looking for ideas for the inclusion of Art in the Woods consult Frances S. Bruyn's article in the Fall-Winter 1971 issue of the Communicator.

Don't overlook the value of films, slides, art and literature in the preparation. Henry David Thoreau's Journal and Aldo Leopold's A Sand County Almanac give a philosophical background about forest succession, and forests and man respectively. In the lower grades it might be interesting to use nursery rhymes or fairy tales to review man's classic attitude toward forests. Comparing the reality with the folklore might do a great deal to correct warped perspectives. Then Robert Frost, Keats, Bryant, or Longfellow might be introduced to provide new dimensions.

Good luck – See you in the forest!

THE SEASHORE ENVIRONMENT:

continued

on the particular student's interest and ability. As the student carefully observes his own animal, he learns how that organism's characteristics help him to adapt successfully to his environment. He may also become aware that these marine animals and all other life are the most successful forms of adaptation on the earth today. This knowledge helps the student form a more complete picture of the ecological approach – not only as it relates to marine ecology, but to all life including his own.

NOTE: The following information will provide the reader with a more complete picture of this outdoor education program.

Outdoor Education and Ecology Film Loops
of Great Neck Environments

The following film loops (Super 8mm) related to marine ecology are available to teachers and students. These film loops, produced and photographed by the author are ideal for acquainting the viewers with the structure, behavior, adaptation, habitat and ecology of the great variety of living things found just beyond the classroom.

WATERBIRDS

Slow motion photography aids the viewer to closely observe the beautiful motion and grace of waterbirds. Among the birds seen are the herring gull, snowy egret, green heron, Canada goose, mallard duck, black duck, sand-piper and yellowlegs.

SEA HORSES AND OTHER INTERESTING MARINE ANIMALS

The locomotion and feeding habits of this most interesting and unusual fish – Hippocampus Hudsonius (Northern Sea Horse) are studied. These sea horses and other specimens (sea urchin, pipefish, filefish, sea anemone, butterfly fish) were all collected by scuba-diving off Atlantic Beach, Long Island.

COLLECTING AND STUDYING GRASS SHRIMP
AND STICKLEBACK FISH

Two students are observed collecting their own specimens for further study and research in the classroom. Methods of collection and study are seen. Emphasis is on the physical adaptation of the animals to its environment.

ESTUARY: PART I, PART II

These film loops provide the viewer with a clear understanding of the concept of ecology, as we observe a variety of living things especially adapted to a particular habitat. The behavior of fish, birds and crustaceans are studied as the tide changes from outgoing low tide (Part I) to incoming high tide (Part II). Both loops should be seen to gain a complete understanding of an estuary system.

Exploring Old Cemeteries

continued

   d. Is there a footstone? How far is the footstone from the headstone?
   e. What kind of vegetation is growing on or near the grave?
   f. Are there any trees growing adjacent to or on the grave? How old are the trees?

2. Find the youngest tombstone.
   a. From what material was the youngest tombstone made?
   b. Where is the youngest tombstone located in the cemetery – Front? Back?
   c. How old was the individual who died?
   d. Is there a footstone? How far is the headstone from the footstone?
   e. Are there any trees growing adjacent to or on the grave? How old are the trees?

3. When was the graveyard abandoned?
   a. How old is the biggest tree growing adjacent to a tombstone or on the grave?
   b. What is the date of the latest burial plot?

4. What is the average age of death in 10 year intervals? For men? For women? For children?

5. Do the designs and shapes of the tombstones change through the years? If so, how?

6. Is there a fence or fencerow surrounding the graveyard? If so, what kind of fence or fencerow?

7. Is there evidence of an epidemic? What kind of evidence?

8. Are there any unusual epitaphs on the tombstones? If so, why are they unusual?

These are just some of the many questions which can be utilized by a teacher and class for exploring an old cemetery.

The questions could be assigned to small groups either collectively or by sets of questions to individual groups. All groups should make tracings of the tombstones for further study back in the classroom. This can be accomplished by the use of crayon or dark pencil and brown wrapping paper or paper bags cut on the sides for maximum surface area. By rubbing pencil or crayon on the paper, a reproduction of inscription or epitaph is made possible. Then taking these replicas back to the school will help to make the experience a generative one, where students can intensify their analysis, develop a more concentrated scrutiny and make a more rigorous evaluation. A visitation to the County Court House for the purpose of delving deeper into historical records will enhance the concepts learned in the field. There are cemeteries within easy access of most school classrooms. Some are old and others are not quite so old. Nevertheless, each can provide a rich learning experience with an intensity to make it a memorable event in lives of school children.

BASIC CONSIDERATIONS:

continued

units afford a mobile reference and resource materials center designed for a realistic approach of learning through direct experience. The mobile unit could be utilized on the school site, nearby park, the community or at a resident outdoor education center.

Reference and resource materials do have a place in outdoor education and properly used they can do much to enrich the meaning of firsthand experience.

Regardless of the method of outdoor teaching employed, there is one basic principle which must be recognized. This principle is that any learning that takes place is always the result of what happens within the student, how he organizes his own system of ideas and what he does about the experience. Outdoor education is just one of various methods of teaching and learning that creates within the student a basic interest in learning. It provides him with a basic set of experiences that will help him to gain a fuller understanding of life around him, the interrelatedness of things found in the natural environment, and a knowledge of man's interdependence with the physical world.